

**MODEL LAND USE PLAN OF MEERUT DISTRICT**

(Revised)

Sponsored by:

**STATE LAND USE BOARD  
DEPARTMENT OF PLANNING  
GOVERNMENT OF UTTAR PRADESH**

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## PREFACE

The availability of land for various uses is limited. Therefore, utilization and conservation of land resources are important for their sustainable use. Formulation of Model Land Use Plan is an important step for promoting a desirable land use. With this view, State Land Use Board, Department of Planning, Government of Uttar Pradesh, entrusted the Giri Institute of Development Studies, Lucknow to prepare Model Land Use Plan for six districts of Uttar Pradesh, namely, Lucknow, Kanpur, Bareilly, Moradabad, Meerut and Agra. The present report is the Model Land Use Plan of Agra district.

We are highly obliged to Shri S.N. Jha, IAS, the then Principal Secretary, Department of Planning, Government of Uttar Pradesh for sponsoring the task to our Institute. Mr. Anis Ansari, IAS, who has been the Principal Secretary, Department of Planning, after Shri Jha, provided us very useful guidance. We are extremely grateful to Shri Amal Kumar Verma, IAS, the present Principal Secretary, Department of Planning for his valuable guidance on the subject. We feel grateful to Shri Kunwar Fateh Bahadur, IAS, and Shri Navtej Singh, IAS, Secretary, Department of Planning for their guidance and encouragement. We are also extending our thanks to Shri A.N. Mishra, IAS, Special Secretary, Planning for his continuous support in pursuance of the study.

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# CHAPTER – I

## GEO-PHYSICAL CHARACTERISTICS

The district of Meerut is named after its headquarters city and is said to be associated with the earliest traditions of the Hindus according to which Maya, the father-in-law of Ravana, founded this place, which has, therefore, been called Maidant-Ka-Khera. According to another version Maya, a distinguished architect, got from King Yudhishthira, the land on which the city of Meerut now stands and he called this place Mayarashtra, a name which in course of time became shortened to Meerut. Tradition also has it that the district formed part of the dominions of Mahipal, King of Indraprastha and the word Meerut is associated with his name.

### 1.1 LOCATION AND AREA

The district of Meerut is situated in the Upper Ganga-Yamuna doab and lies between Lat. 28°32' and 29°18' North and Long. 77°7' and 78°14' East. In shape it is roughly rectangular, its length from East to West varying between 93 kms. and 58 kms. and its breadth from North to South between 77 and 58 kilometres. On the North it is bounded by the District of Muzaffarnagar, on the South by that of Bulandshahar and on the South-West by the Delhi. The Ganga forms its natural boundary on the East and separates it from the districts of Bijnore and Moradabad. Most of its Western boundary is marked by the Yamuna which separates the district from the Rohtak and Karnal districts of Punjab.

The total area of the district was 3,736.6 square kilometres during 1978. The total area of the district is based on the information supplied by the Central Statistical

Organization (CSO). There were 898 inhabited and 97 uninhabited villages in Meerut during this period. The Tahsils of Ghaziabad and Hapur were separated from the district on November 1976 to form the newly created district of Ghaziabad. Subsequently, Pargana Sarawan of Tehsil Hapur, district Ghaziabad was transferred to Tehsil Meerut on January 1977.

## 1.2 PHYSIOGRAPHY

The district is almost a level alluvial plain with a slight slope from North to South or South-East. The average gradient is about two feet in the mile and is almost uniform throughout. The whole of the district is a well cultivated plain and there is no uneven ground except in the area of the ravines near the river valleys and the scattered *bhur* ridges in the upland tract. The only marked difference is that between the central upland and the river valleys. On the whole the district is a tract of extra-ordinarily fertile soil. In the North-West, West and middle (including Tehsils Baghpat, Sardhana, Meerut and Ghaziabad) and lying to the west of Kali Nadi, the soil is richer than the Tehsils Hapur and Mawana (in the East), where the *bhur* soil forms small ridges extending irregularly across the plain.

The main features that affect the plain are the rivers whose valleys are of varying width and are on a lower level than the main upland tract. The flood plains of these rivers are small but the transition from the river valleys to the upland is marked by ravines and erosion or the sloping sandy undulations. Along the Ganga and away from it, the soil has deteriorated for a considerable distance and much of the area East of the Anupshahar branch canal is occupied by long stretches of sandy soil. The soil along the Yamuna is not so inferior. The khadar of the Hindan is comparatively narrow and the

deterioration is generally confined to the immediate neighbourhood of the river and it is only when the Hindan and the Yamuna come closer in the South-Western corner of the district that a narrow strength of inferior soil is met with. The only parts that are liable to be flooded are the Ganga Khadar in the Mawana and Hapur Tehsils, some areas in the low-lying tracts of Pargana Loni and those in the South of Baghpat near the Yamuna. Broadly speaking the district can be divided into four physical divisions – the Yamuna-Hindan doab, the Central depression, the Eastern uplands and the Ganga khadar.

### **I.2.1 The Yamuna-Hindan Doab**

This tract lies between the Yamuna on the West and the Hindan on the East and includes the whole of Tahsil Baghpat and portions of Tahsils Sardhana and Ghaziabad. From a width of over sixteen miles in the North it narrows down to about a third in the South, where these two rivers tend to converge. The tract in general is the most fertile portion of the district consisting of rich and almost uniformly loamy soil and is flanked by belts of poor soil and broken relief associated with the two rivers, the quality of soils, varying slightly from North to South. The Northern portion of the tract contains alluvial soil of excellent fertility but the Southern part is made up of stretches of inferior land, mostly adjacent to the Yamuna, which support poor grasses only. The tract is bounded by the Hindan on the East and by a high ridge (which separates the uplands from the Yamuna khadar) on the West, the soil of which is of a poor quality, the terrain being generally broken up by small ravines. South of the ridge is the low-lying Yamuna-Hindan khadar with its numerous shallow depressions. The khadar land is much wider in the South than in the Northern parts of the tract.

The Yamuna does not have any tributary worth the name in this tract and the Hindan has only two, the Krishni and the Banganga which meet it in the North-East.

There are a number of bhur mounds along the banks of these rivers, on some of which stand the habitations of Chhaprauli, Kotana and Baghpat along the Yamuna and of Barnawa and Baleni along the Hindan.

### **I.2.2 The Central Depression**

This tract, lying roughly between the Hindan and the Muzaffarnagar-Meerut-Bulandshahar road, includes the Western parts of the Tahsils of Sardhana and Meerut and the Eastern portion of Tahsil Ghaziabad.

The soil of the strip between the Hindan and the Ganga canal is of excellent quality except for the usual poor sandy soil along the Hindan. This is a well drained tract, except for a small patch near Muradnagar in Tahsil Ghaziabad and contains some of the most fertile land in the district.

East of the Ganga canal, the slope of the land as far as the centre of this tract is towards the East but from there onwards there is a rise as far as the Muzaffarnagar-Meerut-Bulandshahar road, the depression beginning near Sardhana and extending as far South as the Bulandshahar border and being naturally inadequately drained. Several drains have been constructed in this section but even these artificial aids do not achieve the object of draining the water. The soil here is good but has a tendency to become supersaturated and to give rise to the formation of reh, which is rare in other parts of the district, except in the khadar lands.

### **I.2.3 The Eastern Uplands**

This tract comprises the area between the central depression and the ravines of the Ganga and includes the major portions of the tahsils of Mawana and Hapur and parts



of the tahsils of Meerut and Sardhana. It is drained by the Kali Nadi (East) and its affluents, one of its important features being the existence of a series of sandy bhur strips, sometimes occurring in the form of bluffs which are generally confined to the vicinity of this river and the Ganga, the soil generally resembling that of the bhur ridges adjoining the Ganga khadar. One of these ridges runs diagonally South-East from the point where the Hindan enters the district, passes Meerut and Hapur and extends to the Southern border where it enters the district of Bulandshahar. These bhur strips owe their origin to an admixture of sand in the stratum and to the action of wind but there are stretches of good soil in between which here and there are fairly extensive though the soil is not as rich as in the Yamuna-Hindan doab. The entire Eastern portion is broken up by the Ganga and in the West Pargana Sarawa is very poor in fertility on account of the presence of sand. Further South, to the East of Hapur, there is also sand and the town's West flank is scored by the Kali Nadi (East) and its tributaries. At many places the Anupshahar branch canal, which runs close to the ravines of Ganga and to the scored and broken area that separates the uplands from the Ganga khadar, has improved the Eastern portion of this tract agriculturally.

#### **I.2.4 The Ganga Khadar**

The Eastern-most tract is the low khadar or flood plain of the Ganga. This tract is characterized by the existence of several depressions and water-courses generally connected with the river. In the North it is about six miles in width but gradually narrows down and South of Garhmukteshwar it is not more than three quarters of a mile wide. It is bordered on the West by the old high river bank and this particular area is covered with ravines. Some parts of the khadar are capable of cultivation but the soils are generally light and poor and the tract is mostly covered with tall grass which gives shelter to wild

animals. The alluvial area in the khadar mainly consists of a string of villages bordering the main stream. The Burhganga forms a marked feature of the khadar and flows below the old high bank.

The alluvial deposits of the Ganga and those of its tributaries cover the whole of the district. The minerals found in the district are reh (which is essentially a mixture of sodium carbonate, sodium chloride and sodium sulphate with traces of calcium and magnesium salts) and kankar. Prior to 1833 salt was obtained from the extensive salt-tracts of Tahsil Ghaziabad particularly from the low-lying khadar lands of the Yamuna in Pargana Loni which probably derives its name accordingly.

#### **1.2.5 Reh**

This mineral is found in the tahsils of Meerut and Ghaziabad. There are three strings of occurrences in the Meerut Tahsil: one is near the village of Panchili Khurd about five miles West of Meerut city, in close proximity to the Ganga canal where there is only an occasional sprinkling of the efflorescence; another is about seven miles North-West of the city in the neighbourhood of Puth Khas where the visible patches are few, only sixteen plots having been located; and the third lies along the left bank of the Hindan between Harra (in Tahsil Sardhana) and Nandpura (in Tahsil Meerut) where the layers attain a thickness of 7.5 to 10 cm. In Tahsil Ghaziabad reh occurs intensively between the villages of Siddiqnagar and Dharaoli Khurd which are located in Pargana Loni on the left bank of the Yamuna, the incrustation being almost continuous and about 7.5 cm thick, the average thickness over the entire area being about 2.5 cm. The Northern reh tract of the Loni group has an area of 9,71,098 square metres nearly half of which is covered with visible glistening white reh the average quantity obtained in a year being estimated at 5,296 tonnes. The mineral is also found in a small area in the South-

Western part of Pargana Loni, the amount available being estimated at 2,195 metric tones. About 60,694 square metres in the Loni tract are also covered with reh, the amount available being estimated to be 329.2 tonnes per year.

### **I.2.6 Kankar**

*Kankar* occurs in various parts of the district in block as well as nodular form. It is used for construction purposes in canal works and as road metal. The well-known block kankar pits are those of Nandpur and Nirainpur in Tahsil Ghaziabad. Nodular kankar is found in all parts of the district especially in the neighbourhood of the towns of Hapur and Ghaziabad.

## **1.3 RIVERS AND DRAINAGE**

The principal rivers of the district from East to West are the Ganga, the Hindan and the Yamuna, a brief description of which and of their tributaries is given below.

### **I.3.1 Ganga**

This river first touches the district in the North-East, near the village of Bela in Tahsil Mawana. Its general direction is from North to South and throughout on the Eastern flank it separates this district from those of Bijnore and Moradabad. In the district it has only two tributaries - the Burhganga and the Soti, both significant streams. The former flows in an old bed of the Ganga and the latter joins the river at the village of Jalalpur in Tahsil Mawana.

The bed of the river is sandy and there is an underlying stratum of nodular limestone here and there. The river's volume and velocity vary at different periods of the

year and are greatest during July and August. In summer it is hardly a furlong wide but during the rainy season its span exceeds a mile. It is fordable only at particular places during the cold weather. Its banks generally suffer from slow erosion and the soils of the khadar villages which lie adjacent to it from increasing infertility due to the sand that it deposits when in flood, which is usually in the monsoon months.

Prior to the construction of canals and railways in the district, the river was used for irrigation and was a great water-way as well but now it is used only for navigation. The only town of importance on its banks in this district is Garhmukteshwar (in Tahsil Hapur). An ancient tradition records the destruction by it of the old city of Hastinapur some centuries before the beginning of the Christian era when it probably occupied the course which the Burhganga now takes.

(i) **Burhganga**: This is a small tributary of the Ganga and is a fluctuating stream entering the district from Muzaffarnagar at the village of Ferozpur Saifpur. Its name (meaning 'old Ganga') indicates that it flows in a bed in which the Ganga once flowed. According to a statement in Timur's memoirs, he camped on the banks of the Ganga at Ferozpur. If this place is identical with the Ferozpur Saifpur mentioned above, then either the memoirs mistook the Burhganga for the Ganga or the Ganga till then flowed in the course now occupied by the Burhganga (the implication being that the latter came into existence only after 1398-99). After entering the district the Burhganga flows southwards into Pargana Garhmukteshwar where it joins the Ganga. At many places it resembles a chain of swamps, its distance from the high bank (which separates the khadar from the uplands) being a furlong on an average. In the hot weather it is dry in places and though its depth varies considerably, some of its larger swamps always hold water and rushes, used for making matting and reeds for making wickerwork chairs are

found in them in abundance. It is a sluggish and irregular stream and is not of much use on the whole.

(ii) **Kali Nadi**: This river is also known as the Nagin (probably on account of its serpentine windings) and also as the Kali Nadi (East) to distinguish it from the Kali Nadi (West), a tributary of the Hindan. Generally it traverses undulating sandy slopes which are rarely cut up into ravines. The river has no important towns on its banks and carries very little water except during the rains when it is about fifty yards wide, the breadth increasing to about a furlong in exceptionally wet years. It is joined in its course by three smaller streams, two of which are known by the generic name of Chhoiya.

(iii) **The Hindan**: This river enters the district from Muzaffarnagar at the village of Pitlokhar (in Tahsil Sardhana) and flows South - South-West in a tortuous course till it leaves the district near the village of Mekanpur in Tahsil Ghaziabad. Two of its tributaries are the Krishni and the Banganga which join it near Barnawa, which is a village of importance on its banks. The breadth of the river varies from a furlong in the hot weather to about half a mile in the rains. It is fordable for most of the year except during the rains when it is also navigable. It is used as a sort of link between the Ganga and the Yamuna, as it receives the superfluous water of the former from the tail end of the Deoband canal near Budhana (in the Muzaffarnagar district) which it conveys into the Yamuna through an artificial channel just below the railway bridge near Ghaziabad.

The Hindan is an active river from the point of view of soil erosion and it has been estimated that in Tahsil Ghaziabad alone over fifty acres are subject to erosion annually. The khadar lands of the river vary in width at different places and extend a mile on each side of the stream at Malahara but are only about one-fourth of a mile in breadth at

Barnawa. As the river proceeds southwards the khadar widens out on both sides of its banks. Although it is affected by a saline efflorescence known as reh its water are used for irrigating the Rabi crops.

(iv) **Krishni**: The Karsuni or Krishni, a small stream between the Yamuna and the Hindan, enters the district near the village of Tikri (in Pargana Barnawa) and after flowing in a well-marked bed for twelve miles joins the Hindan near the village of Barnawa. It is an insignificant stream with no towns on its banks and is little used for irrigation.

(v) **Banganga**: Another insignificant stream between the Yamuna and the Hindan is that Bangana which enters the district from Muzaffarnagar at the village of Dhanaura. After traversing a distance of about eight miles it meets the Hindan at the village of Shahpur (in Pargana Barnawa). It sometimes dries up during the summer but gets filled up during the rainy season when its depth varies from four to five feet, its average width being about fifty feet.

### **I.3.2 The Yamuna**

According to a Hindu legend this river (which is held sacred by the Hindus) is supposed to be a goddess being the daughter of Surya, the sun god. It first touches the district about two miles North of the village of Tanda (in Pargana Chhaprauli) and flows southwards forming the boundary of the district as far as the point where the district of Meerut, the Delhi State and the district of Rohtak (in Punjab) meet. From here it leaves the boundary between the district and Delhi three times over a distance of about nine miles till it finally goes out of the district adjacent to the village of Harampur (in Pargana Loni). There is considerable variation in the height of its left bank which in Tahsil Baghpat is characterized by the existence of steep and abrupt ridges some of which are



flat and comprise the sites of largest habitations. The small lowlying areas between the bank and the river are often affected by the floods which benefit the soil by leaving alluvial deposits. Near Chhaprauli, Kotana and Baghpat it takes a slight bend to the West for a few miles. In times of heavy floods it approaches the outskirts of these places which are all situated on the crest of the high bank. Further South the bank is not high as a result of which some parts of Pargana Loni are often flooded. The bed of the river is so low in places that irrigation is impracticable and its water is only used for the cultivation of melons which grow on its sandy banks and are much prized for their excellence.

The width of the river is about a furlong during the winter but shrinks to half a furlong in the hot weather when much of the water is drained off by the canals, making it fordable almost everywhere. During the rains the river ranges from a mile to a mile and a half in width.

### **I.3.3 Drainage**

There are several other lines of drainage, the chief being described below:

(i) **Abu Nala**: This is one of the tributaries of the Kali Nadi (East). It was converted into a channel in 1869 to bring the waters of the Hindan across the Ganga canal for irrigating the Pargana of Meerut. The attempt was not successful and the section near Daulatpur was converted into an escape but this project was also abandoned and another channel, the Jani escape, was made. From Kapsarh to the East of the Ganga canal the Nala is connected with a line of drainage which runs southwards by Pabli where it is



joined by the Alipur drain. The Nala finally joins the Kali Nadi (East) at the village of Kamalpur, where it is known as the Khodan.

(ii) **Kirthal Drain**: With the help of its tributaries – the Ramla, Mukandpur and Malakpur drains – the Kirthal Drain carries off the rainy water of an area of about fifty square miles lying between the Eastern Yamuna canal and the Nala distributary. The general direction of flow is from North to South and it falls into the Yamuna near Luhari.

(iii) **Kandhala Drain**: This channel serves the area lying between the Kandhala distributary on the West and the Yamuna canal on the East. It takes off from ponds near Kandhala town (in the district of Muzaffarnagar) and flows North to South, crossing the Nala distributary. It drains off the area of the villages of Lumb, Kakripur, Kirthal, Ramala and Budhpur (all in Pargana Chhaprauli).

(iv) **Alium Drain**: This drain takes off from the ponds of village Alium (in the district of Muzaffarnagar). Flowing North to South, it falls into the Hindan near village Asara (in Tahsil Baghpat).

(v) **Alawalpur Drain**: This is a tributary of the Yamuna and gets its name from the village situated at the hundredth mile of the Eastern Yamuna canal. The general direction of flow is from North to South. After flowing through the Yamuna Khadar it falls into the Yamuna near Baghpat. It drains off the area occupied by the villages of Angadpur, Alawalpur, Ahmadpur, Bazidpur, Bijrol, Bam, Bichpari, Barka, Barawadh, Chhacharpur, Gorana, Gadhi, Naurozpur and Sisna (all in Tahsil Baghpat).

## **1.4 GROUND WATER**

True swamps hardly exist in the district but at times wide stretches of water occur along the river beds. There are a few jhils of importance in the parganas of Chhaprauli, Kotana, Baraut and Baghpat, the chief being in the khandars of the Ganga and the Yamuna. The chief depressions in the district are in Makanpur (in Pargana Loni), Kharoli, Pathanpura, Rampur and Sobhapur (all in Pargana Meerut) and in Bhikanpur, Sara, Kakra, Khurrampur, Jora, Bawantpur, Sainthli and Pasonda (all in Tahsil Ghaziabad). Those in pargana Dasna are known locally as dahars and sotis, in the former category being the Karanpur, Parpa, Sapnawat, Bajhera and Kapurpur jhils and in the latter those of Matyala, Kusalia and Rasulpur Sikroth. The large reservoirs at Dhaulana and Masuri (both in Pargana Dasna) are just called jhils.

## **1.5 CLIMATE**

During the major part of the year the climate of the district is influenced largely by the prevalence of dry air of the continental type, the summer being intensely hot and the winter cold. It is only during the monsoon months that air of oceanic origin reaches the district, bringing with it increased humidity, cloudiness and rain. Climatically the year may be divided into four seasons. The cold season, from about the end of November to the beginning of March, is followed by the hot season which continues till about the end of June when the South-West monsoon arrives, the monsoon season lasting till September and the next two months forming the transitional period.

### **1.5.1 Rainfall**

In this district the monsoon winds from the Bay of Bengal and the Arabian Sea almost meet, the former having become weak by the time they reach the district and the

latter, when weak or diverted by cyclonic storms in central India, not reaching the district at all. Consequently, the monsoon rainfall of the district is light and often uncertain.

The records of rainfall maintained at the seven rain-gauge stations in the district extend to over ninety years and show a marked variation from year to year. The rainfall generally increases from South-West to North-East. 73 per cent of the annual rainfall is received during the South-West monsoon season. July being the month with the maximum rainfall. The normal rainfall in the district is 720.2 mm (28.35"). During the fifty year period from 1901 to 1990, the highest annual rainfall was in 1933-34 when it amounted to 169 per cent of the normal and the lowest in 1907-08, when it was 45 per cent of the normal. In 12 years of this fifty years period of which two were consecutive, the rainfall was less than 80 per cent of the normal and in thirty-eight years the annual rainfall in the district was between 500 and 1,000 mm.

On an average there are, in the district, thirty-seven rainy days (days with rainfall of 2.5 mm or more) in a year. The heaviest rainfall in twenty-four hours at any station in the district was 393.7 mm (15.50") at Mawana on September 18, 1880.

A statement regarding the frequency of the annual rainfall in the district is given below for the period 1901-1990:

Range in mm.	Number of years	Range in mm.	Number of years
301-400	3	801-900	5
401-500	5	901-1000	5
501-600	6	1001-1100	3
6991-700	10	1101-1200	0
701-800	12	1201-1300	1

### **1.5.2 Temperature**

There is a meteorological observatory at Meerut, the records of which may be taken as representative of the meteorological condition in the district. Temperatures start rising from the beginning of March, heralding the onset of the hot season and hot Westerly winds (locally known as 'loo') begin to blow from April onwards, the heat often becoming intense in both May and June when the maximum temperature may go upto 46°C (115°F.) at times. May is the hottest month with the mean daily maximum temperature at 40°C (104°F.) and the mean daily minimum at 25.3°C (77.5°F.) though the night temperatures in June are higher than those in May. The hot winds usually cease by mid-June and with the advent of the South-West monsoon at the end of June day temperatures drop appreciably but the nights continue to be warm. Day temperatures, however, rise again during breaks in the rains and with the increased moisture in the air the weather is often uncomfortable. The drop in both day and night temperatures (which begins in October, making the weather pleasant) becomes strongly marked after the middle of November. January is the coldest month with the mean daily maximum temperature at 20.9°C (69.7°F.) and the mean daily minimum at 8.1°C (46.5°F.). When the district is in the grip of cold waves (which occur in the wake of Western disturbances in the winter months), the minimum temperatures sometimes fall to the freezing-point of water. The lowest minimum temperature recorded at Meerut was 0.6°C (30.9°F.) on January 31, 1905, and the highest maximum temperature was 46.1°C (115°F.) on June 13, 1901.

### **1.5.3 Humidity**

The air is dry for the most part of the year. In April and May, which are usually the driest months, the relative humidity is very low particularly in the afternoons.

#### **1.5.4 Cloudiness**

The skies are usually heavily clouded or overcast during the monsoon season, particularly in July and August. During the rest of the year the skies are generally clear or lightly clouded except in the months of January, February and early March when they sometimes become cloudy or are even overcast in association with the passage of Western disturbances.

#### **1.5.5 Winds**

In the post-monsoon and winter months the winds are generally light but they get stronger in the summer and the monsoon months. Easterly or South-Easterly winds predominate in the monsoon season and westerlies or north-westerlies in other seasons. The mean wind speed, in kilometres per hour, for the district is 4.7 in January, 7.7 in February, 6.9 in March, 7.9 in April, 8.9 in May, 9.0 in June, 7.2 in July, 6.6 in August, 6.3 in September, 4.7 in October, 4.2 in November and 3.9 in December, the annual speed being 6.5.

#### **1.5.6 Special Weather Phenomena**

The highest incidence of thunder-storms and dust-storms (which are often accompanied by violent squalls) occur between April and June. Some of the thunder-storms are dry, others being accompanied by heavy rain and sometimes even by hail. Thunderstorms sometimes occur in association with Western disturbances in the winter months when the district also experiences occasional fogs.

### **1.6 FLORA AND FAUNA**

The district forms part of the Northern subtropical deciduous type of vegetation division but as it is devoid of extensive natural vegetative cover it is not possible to attach

botanical labels to its forests. The trees generally found here are *Shisham* (*Daibergeria sissoo*), *jamun* (*Syzygium cumini*), *mango* (*Mangifera indica*), *siris* (*Albizia lebbek*), *imli* (*Tamarindus indica*) and *neem* (*Azadirachta indica*).

Being extensively developed agriculturally the district has a comparatively small proportion of waste or barren land which is under the control either of the forest department or of the gaon samajs, the area under the former being 22,658 acres of which there are 1,585 acres in Tahsil Meerut; 2,265 acres in Tahsil Hapur; 14,233 acres in Tahsil Mawana; 2,722 acres in Tahsil Sardhana; 268 acres in Tahsil Baghpat; and 1,554 acres in Tahsil Ghaziabad. The main areas where some vegetation can be seen are the khadars (ravined strips), the former being covered mostly with Jhau (*Tamarix*), coarse grasses such as munj (*Saccharum munj*) kans and patera (*Typha elephantis*) and straggling bushes of ber (*Zizyphus locarous*). The general appearance of the latter coupled with the existence of unpalatable scrubs, indicates that both these areas once enjoyed luxuriant vegetation but it appears that in order to meet the increasing demand for land for purposes of cultivation and grazing they were denuded of their forest growths. Large tracts of these areas have been planted by the forest department with valuable timber and fuel producing species like shisham, arru (*Alanthus excelsa*), Jamun, mahua (*Madhuca indica*), siris, bahera (*Terminalia ballerica*), babul (*Acacia Arabica*) which is also known locally as kihar, etc., the area afforested in the Hastinapur kholas being 5,500 acres. This newly established forest has started yielding a revenue of about Rs.20,000 every year by the sale of minor products like munj and other grasses, reeds, sticks for brooms, honey and khajur (*Phoenix*) leaves. It is expected that in the coming years these plantations will help to check erosion and will provide fuel and fodder reserves to meet the demands of the local population.



Arifpur, Nizampur, Puth and Hasanpur (all in Tahsil Hapur) have a large area under groves, the chief products being guava, bef, papaya and mango. The chief fruit-producing places in Tahsil Mawana are Shahjahanpur, Parichhatgarh, Mawana Khurd and Mawana. Those in Tahsil Sardhana are Jualagarh, Kasauli, Sardhana, Daurala and Daulatpur. The commonest tree found in these groves is the mango but the district is noted for many other varieties of fruit-trees, such as the ber (*Zizyphus Xylocarpus*), the guava and the citrus which cover a large area. Among other fruit-trees of the district are the loquat, papaya, peach, apple and several varieties of plum.

Both in the Mahabharata and in the works of Kalidas there is mention of huge and dense forests to the North of Hastinapur in which it appears elephants lived in large numbers, the town for this reason perhaps getting the name of Gajapura (city of elephants). This place is known by many other names and it is probably not a mere coincidence that they are mostly synonyms of the word meaning elephant. Wild elephants were to be found in these forests till about the middle of the nineteenth century but with larger areas being brought under the plough, their domain was usurped and they gradually disappeared. The same fate has befallen another lordly denizen of the jungle the tiger, which is not found in the district today though only a century ago the Ganga khadar used to abound with it. The only tiger to be shot in the district during the last six decades was in the Hastinapur kholas in January, 1956, which had possibly stayed into the district from the adjoining region of Bijnore.

Among the animals found in the district are the monkey, wolf, hyena, fox and pig. Leopards and hyenas are found occasionally in the khola and khadar areas of the Ganga. The graceful Indian black buck and the nilgai (blue bull) are common in most parts of the district and so is the ubiquitous jackal. Wild pigs, which in the beginning of the century



were found in large numbers in the Ganga khadar and also elsewhere, are very scarce now and the old practice of pig-sticking is not indulged in any more.

**I.6.1 Birds** : Winged creatures of many species inhabit the district. Among the game birds the most common are duck, geese and teal which are found in the Ganga khadra and along the Burhganga, the Hindan and the Yamuna. Partridges, both black and grey, are fairly common in the Hapur and Mawana, Tahsils specially in the Ganga khadar. Some of the other birds commonly found in the district are the sun-bird, nilkanth (*Coracas bengalensis*), barbet, king-fisher, hornbill, hoopoe (*Upapa eops*), swift, nightjar, hawk-cuckoo, koel (*Eudynamis scolopaccus*), crow pheasant, parrot, barn own, vulture, kite, peafowl, myna, crow, dove, shikra (*Astur oadius*), tailor-bird, black drongo, robin, swallow, weaver-bird, babbler, bulbul, pigeon, grouse and quail. The common water-birds are the sarus (*Antigone antigone*), coot, snake-bird, adjutant stork, snipe, heron, cormorant, stilt, stork, egret, moorhen, tern and grebe.

**I.6.2 Reptile** – In the Ganga crocodile garial (ghariyal) and turtle are fairly common. The bamhni (*Mabuia* sp.), chameleon and house lizard are found everywhere. The other varieties of lizards found here are the sanda (*Uramaxsti harwicki*) and goh (*Varanus monitor*). About three dozen varieties of snakes are also found in the district, some of which such as Shashker Tapra, are rare. Among the poisonous snakes are the cobra, krait, teliya kumudi and kausra haraurdi and among the non-poisonous are the wolf-snake, pond-snake, rat-snake, earth-snake and blind snake, all of which are fairly common. Among amphibians, frogs (*Rena tigrina* and *Bufo melenostictus*) are met with in abundance.

**I.6.3 Fish** – The Kali Nadi (East), which is only five miles from Meerut city, was rich both in quantity and in variety of fish till about a decade ago when owing to the continual flow into its waters of molasses from sugar factories and the refuse from the central distillery in Meerut cantonment, the fish began to die at an early stage of development. Before this pollution of the water, the daily catch from the river was about ten maunds which was sufficient for local consumption but now it is practically nil. The fish market of Meerut city now depends on the catch from the Hindan and the Yamuna.

About sixty species of fish are found in the district. Of these the singhara (*Mystus seenghala*), silund (*Silundia silundia*) gonch (*Bagarius bargarius*), rita (*Rita rita*), katla (*Catla catla*), maigal (*Cirrhina reba*) and rohu (*Labeo calbasu*) have a good market. The cheap species include singhai (*Heteropneustes fossilis*), moli (*Wallago attu*), vacha (*Eutropilchihys vashas*), tengra (*Mystus tengara*), bam (*Mastacembelus armatus*) and eal (*Amaohiphous cuchia*). The price of fish varies from a rupee to ten rupee per seer.

## **CHAPTER – II**

### **POPULATION AND LAND RESOURCES**

#### **II.1 POPULATION STRUCTURE**

As per Census figures relating to population of 1991 the district of Meerut constituted 1.79 per cent of total Uttar Pradesh's population. Out of total population of 2417513 in Meerut about 54 per cent were males as against 46 per cent females. The rural population of the district was found to be only 55 per cent against more than 80 per cent at the state level during the same period (Table 2.1). The Scheduled Castes and Scheduled Tribes of the district constituted 18.59 per cent of the total population as against 21.26 per cent at the state level during the same period. In case of sex ratio, 858 females per thousand of males population was found in the district. However, the same was higher (879 females per thousand males) at the state average level.

The population density of the district was recorded to be as high as 943 persons per square kilometres as against only 473 persons per square kilometres at the state average level. The average high population density in Meerut district is found mainly due to higher concentration of population in the urban part of the district.

A perusal of age-wise population distribution among different categories indicated around 14 per cent population falling below the age of 4 years. The children in the age group of 5 to 9 years and 10 to 14 years constituted 13.85 per cent and 12.51 per cent

respectively in the district. About 10 per cent population belonged to the age group of 15 to 19 years.

Table – 2.1: **Population characteristics of District Meerut (1991)**

Sl. No.	Items	Meerut	U.P.	% total U.P.
1.	Population	2417513 (100.00)	139112000 (100.00)	1.74
2.	Male	1301258 (53.83)	74037000 (53.22)	1.76
3.	Female	1116255 (46.17)	65075000 (46.78)	1.72
4.	Rural	1329037 (54.98)	11506000 (80.16)	1.19
5.	Urban	1088476 (45.02)	27606000 (19.84)	3.94
6.	SC	448723 (18.56)	29276455 (21.05)	1.53
7.	ST	79 (0.003)	287901 (0.21)	0.03
8.	Sex Ratio*	858	879	
9.	Density**	943	473	

\* Per Thousand of male; \*\* Per sq. km.

Source: Statistical Bulletin (1999).

The population share in the category of working age group (15 years to 59 years) constituted 51.43 per cent of the total population in the district. The population falling in this age group was recorded to be 52.28 per cent in urban areas and only 50.74 per cent of the total population in the rural areas of the district. The male and female population falling in this age group constituted 51.72 per cent and 51.10 per cent of the total population respectively (Table 2.2).

Table. 2.2: Age-Wise population structure of Meerut

(1991)					
Age-Group	Male	Female	Total	Rural	Urban
0-4	177101 (13.61)	160294 (14.36)	337395 (13.96)	189255 (14.24)	148140 (13.61)
05-09	175410 (13.48)	159401 (14.28)	334811 (13.85)	184205 (13.86)	150606 (13.84)
10-14	159794 (12.28)	142769 (12.79)	302563 (12.51)	164535 (12.38)	138028 (12.68)
15-19	133769 (10.28)	107160 (9.60)	240929 (9.97)	132638 (9.98)	108291 (9.95)
20-24	107744 (8.28)	92984 (8.33)	200728 (8.30)	108848 (8.19)	91880 (8.44)
25-29	92780 (7.13)	134397 (12.04)	227177 (9.40)	92102 (6.93)	135075 (12.41)
30-39	151857 (11.67)	92426 (8.28)	244283 (10.10)	148586 (11.18)	95697 (8.79)
40-49	110737 (8.51)	63181 (5.66)	173918 (7.19)	111506 (8.39)	62412 (5.73)
50-59	76124 (5.85)	80259 (7.19)	156383 (6.47)	80673 (6.07)	75710 (6.96)
60& Above	115942 (8.91)	83384 (7.44)	199326 (8.25)	116689 (8.78)	82637 (7.59)
All age	1301258 (100.00)	1116255 (100.00)	2417513 (100.00)	1329037 (100.00)	1088476 (100.00)

Note : Figures in Bracket are percentage to total population.

Source: Statistical Bulletin (1999)

The old age population (more than 60 years) was 8.25 per cent. It was recorded to be higher, 8.78 per cent in rural areas as compared to a lower of 7.59 per cent in the urban part of the district. Like-wise the old age population was recorded to be higher (8.91 per cent) among males than only 7.47 per cent among females in the district. A comparison of the age wise population distribution among different categories between the district and state showed almost same results.

Table 2.3: Age-wise Population structure of U.P.

(in 000)

Age-group	Male	Female	Total	Rural	Urban
0-4	9790 (13.22)	9264 (14.23)	19054 (13.70)	15589 (13.98)	3465 (12.55)
5-9	10604 (14.32)	9479 (14.57)	20083 (14.44)	16359 (14.67)	3724 (13.49)
10-14	9234 (12.48)	7704 (11.84)	16938 (12.17)	13457 (12.07)	3481 (12.61)
15-19	7358 (9.94)	5627 (8.65)	12985 (9.34)	10094 (9.05)	2891 (10.47)
20-24	5822 (7.86)	5538 (8.51)	11360 (8.17)	8910 (7.99)	2450 (8.88)
25-29	5253 (7.09)	4997 (7.68)	10250 (7.37)	8079 (7.24)	2171 (7.86)
30-39	8692 (11.74)	8164 (12.54)	16856 (12.12)	13202 (11.84)	3654 (13.24)
40-49	6687 (9.03)	5864 (9.02)	12551 (9.02)	10013 (8.98)	2538 (9.19)
50-59	4661 (6.29)	3854 (5.92)	8515 (6.12)	7023 (6.30)	1492 (5.40)
60 & above	5937 (8.03)	4584 (7.04)	10521 (7.56)	8781 (7.88)	1740 (6.30)
Total	74037 (100.00)	65075 (100.00)	139112 (100.00)	11506 (100.00)	27606 (100.00)

Note : Figures in Bracket show the percentage of the total  
Source: Statistical Bulletin (1999)

## II.2 WORK FORCE

Out of total population of the district 7,20,852 were identified as workers which constituted 29.82 per cent of the total population as per census 1991. As against this, the share of total workers was recorded to be the 32.20 per cent at the state level during the same period. The total main workers constituted 28.17 per cent and total marginal 1.64 per cent of the total population in the district. The same figures were 29.73 per cent and 2.47 per cent respectively during the same period at the state level (Table 2.4)



**Table 2.4: Worker-wise break-up of Population of Meerut District**

(1990-91)		
Item	Meerut	U.P.
Total Population	2417513 (100.00)	139112000 (100.00)
Total Main Worker	681104 (28.17)	41361000 (29.73)
Total Marginal Worker	39748 (1.64)	3438000 (2.47)
Total Worker	720852 (29.82)	44799000 (32.20)

Note : Figures in bracket indicate the percentage of total main workers.

Source : Statistical Bulletin (1999)

### **II.3 CLASSIFICATION OF POPULATION**

A classification of total main workers among different categories in the district further showed maximum concentration of main workers as cultivators (28.38 per cent). It was followed by agricultural labourers where 19.92 per cent of the total main workers were found to be engaged. The share of main workers engaged in animal husbandry and plantation was 1.35 per cent. The percentage of cultivators in total main workers which was recorded to be highest among all categories in the district was found to be far lower as compared to the state average (53.26 per cent). This was an outcome of higher population concentration in urban part of the district.

The employment of main workers in other sectors than the agriculture in the district showed that the proportion of engagement in non-household industry was far higher (13.53 per cent) than the workers in household industry (3.47 per cent). The percentage engagement of workers in both the categories was recorded to be higher in the district as compared to the state average (Table 2.5). The construction activities of



the district commanded only 2.42 per cent of the total main workers. However, the engagement of workers in trade and commercial activities was recorded to be 11.03 per cent against only 6.17 per cent in the same at the state level. In the transport, storage and communication activities 3.58 per cent workers were found to be employed in the district. The engagement of main workers in the category of other services was recorded to be quite high i.e. 16.31 per cent. The same was recorded to be only about 10 per cent at the state level. Thus, a significant chunk of total main workers was found absorbed in service sector of the district Meerut.

Table 2.5 : **Classification of Workers**

S.N	Category	Meerut	U.P.
1.	Cultivators	193288 (28.38)	22031000 (53.26)
2.	Agricultural Labours	135650 (19.92)	7833000 (18.94)
3.	Animal Husbandry & Plantation	9207 (1.35)	296000 (0.72)
4.	Industry & Mining	39 (0.01)	35000 (0.08)
5.	Household industry	23641 (3.47)	997000 (2.41)
6.	Non household industry	92149 (13.53)	2208000 (5.34)
7.	Construction	16500 (2.42)	511000 (1.24)
8.	Trade & Commerce	75095 (11.03)	2551000 (6.17)
9.	Transport Storage & Communication	24406 (3.58)	771000 (1.86)
10.	Other Services	111129 (16.31)	4128000 (9.98)
	Total Main Workers	681104 (100.00)	41361000 (100.00)

**Note** : Figures in bracket indicate the percentage of total main workers.

**Source** : Compiled from statistical Bulletin (1999)

## II.4 LITERACY

As per census figures 1991, the district had a literacy rate of 52.3 per cent which was far higher as compared to the state average (42.0 per cent). Among male population the literacy rate of 64.7 per cent and 37.6 per cent among females was the witnessed during this period (Table 2.6). As against these, the same was recorded to be the 56 per cent and 25 per cent among males and females respectively at the state level.

However, in the rural areas of the district the literacy rate turned out to be lower (41.1 per cent) as compared to the state average (50 per cent) during the same period. Among rural male of the district it was recorded to be the 61.7 per cent and only 27.4 per cent among females. In the urban part of the district literacy rate was about 60 per cent which was higher than the rural part but lower then the same at the state level (70 per cent). The literacy among urban males and females was seen to be 68.3 per cent and 49.5 per cent respectively in the district.

Table 2.6 : Percentage of Literacy in Meerut (1991)

Item	Meerut	Uttar Pradesh
<b>Total District</b>		
Male	64.7	55.73
Female	37.6	25.31
Total	52.3	41.60
<b>Rural</b>		
Male	61.7	52.05
Female	27.4	19.02
Total	46.1	36.66
<b>Urban</b>		
Male	68.3	69.98
Female	49.5	50.38
Total	59.6	61.00

Source: Statistical Bulletin (1999)

## **II.5 LAND AVAILABILITY**

As the land resource is limited as against population, which is ever increasing in our country any change in population is likely to affect availability of land resource in years to come. The population projections of the district and the state, which have been undertaken taking into considerations past growth, indicated significant growth in population in the district as well as in the state. This in turn, has reduced the per capita availability of geographical area and net sown area. The estimation of land availability in coming years is undoubtedly an important exercise in order to chalk out a need based land use plan.

## **II.6 PROJECTION OF POPULATION**

The population of district Meerut which was 24.18 lakhs during the year 1990-91, has increased more than 30 lakhs by the year 2000-01, registering thereby an annual growth of 2.41 per cent as against the population growth of 1.94 per cent per annum at the state level. As per population projections, the population of the district which is estimated to be 30.02 lakhs during 2000-01, as per ensures figures, may go up to 35 lakhs by the end of the year 2009-10.

In view of increase in population, the capita availability of geographical area which was about 0.10 hectare during the year 2000-01 may go down to 0.08 hect during the year 2009-10 in the district of Meerut (Table 2.7). The average per capita availability of geographical area at the state level too is likely to go down to 0.13 hect. from 0.15 hect. during the same period. On account of higher population growth coupled with bifurcation of district area. There has been a sharp decline in the per capital availability of

geographical areas. The per capital availability of geographical area which was 0.16 hect. in the district as compared to state average (0.17 hect.) during the year 1990-91 has gone down to 0.08 hect. The same was recorded to be only 0.09 hect. as compared to the 0.14 at the state level during the next year i.e. 2000-01 (Table 2.7).

Table 2.7: Projected Population of Meerut District and Uttar Pradesh (1990-91 to 2010)

Year	Meerut			Uttar Pradesh		
	Male	Female	Total	Male	Female	Total
1990-91	1301258	1116255	2417513	74036957	65075330	139112287
2000-01	1604103	1397533	3001636	87466301	78586558	166052859
2001-02	1628967	1426881	3055848	88367204	79891095	168258299
2002-03	1653831	1456229	3110060	89268107	81195632	170463739
2003-04	1678695	1485577	3164272	90169010	82500169	172669179
2004-05	1703559	1514925	3218484	91069913	83804706	174874619
2005-06	1728423	1544273	3272696	91970816	85109243	177080059
2006-07	1753287	1573621	3326908	92871719	86413780	179285499
2007-08	1778151	1602969	3381120	93772622	87718317	181490939
2008-09	1803015	1632317	3435332	94673525	89022854	183696379
2009-10	1827879	1661665	3489544	95574428	9032739	185901819

## **II.7 PER CAPITA AVAILABILITY OF LAND**

Per capita availability of net sown area, which was 0.12 hect. as compared to 0.19 hect. as state average, is likely to go down by 0.05 hect. by the year 2009-2010. However, the availability of the same at the state level is likely to remain higher (0.10 hect.) during the same period.

Table 2.8: Per capita Availability of Land : Reported and net cultivated Area

Year	Estimated Population of Meerut	Meerut		Estimated Population of U.P.	Uttar Pradesh	
		Per Capita availability of land			Per Capita availability of Land	
		Reported area(Hect)	Net Cultivated area (Hect)		Reported area (Hect)	Net Cultivated area (Hect)
1990-91	2417513	0.162	0.128	139112287	0.175	0.119
2000-01	3001636	0.092	0.067	166052859	0.146	0.101
2001-02	3055848	0.090	0.065	168258299	0.144	0.100
2002-03	3110060	0.089	0.063	170463739	0.142	0.099
2003-04	3164272	0.087	0.061	172669179	0.140	0.098
2004-05	3218484	0.086	0.059	174878619	0.138	0.097
2005-06	3272696	0.084	0.058	177080059	0.137	0.096
2006-07	3326908	0.083	0.056	179285499	0.135	0.095
2007-08	3381120	0.082	0.054	181490939	0.133	0.095
2008-09	3435332	0.080	0.052	183696379	0.132	0.094
2009-10	3489544	0.079	0.051	185901819	0.130	0.093

## II.8 LAND HOLDINGS: NUMBER

Data relating to distribution of land holdings in different categories out of total number of land holdings in the district Meerut indicated that about three-fourths land holdings belonged to the marginal category during the year 2001-2002. Small and marginal holdings taken together constituted about 85 per cent of the total land holdings. The share of medium and large land holdings constituted little more than 18 per cent of the total holdings during this period. A perusal of land holdings distributions at the state level showed a lower share (10 per cent) of total holdings under the categories of medium and large land holdings.

An analysis of trend projection relating to distribution of number of land holding among different categories indicated that the share of land holdings falling in the medium and large group are increasing in the district Meerut. As per project data presented in Table 2.9, the share of land holding in this group which was 15.38 per cent during the



year 2000-01 was expected to go down to 13.60 per cent by the end of the year 2009-2010. In earlier years prior to 2000-01, the share of medium and large land holdings was also seen to be moving down from 18.43 per cent to 16.39 per cent.

**Table 2.9: Trend of Projections of Number of Land Holding in District Meerut and Uttar Pradesh**

Year	Meerut (in thousand numbers)				U.P. (in thousand numbers)			
	Marginal	Small	Medium & large	Total	Marginal	Small	Medium & large	Total
1985-86	159 (62.35)	49 (19.22)	47 (18.43)	255 (100.00)	13782 (72.59)	2964 (15.61)	2239 (11.80)	18985 (100.00)
1990-91	166 (63.36)	50 (19.08)	46 (17.56)	262 (100.00)	14819 (73.82)	3118 (15.53)	2137 (10.65)	20074 (100.00)
1995-96	183 (65.13)	52 (18.50)	46 (16.37)	281 (100.00)	15574 (75.59)	2983 (14.48)	2046 (9.93)	20603 (100.00)
2000-01	187 (66.49)	51 (18.13)	43.25 (15.38)	281.25 (100.00)	15017.55 (74.49)	3103.25 (15.39)	2038.90 (10.12)	20159.70 (100.00)
2001-02	187.80 (66.76)	50.80 (18.06)	42.70 (15.18)	281.30 (100.00)	15057.26 (74.63)	3100.30 (15.37)	2019.28 (10.00)	20176.84 (100.00)
2002-03	188.60 (67.04)	50.40 (17.98)	42.15 (14.98)	281.35 (100.00)	15096.97 (74.76)	3097.35 (15.34)	1999.66 (9.90)	20193.58 (100.00)
2003-04	189.40 (67.31)	50.40 (17.91)	41.60 (14.78)	281.40 (100.00)	15136.68 (74.89)	3094.40 (15.31)	1980.04 (9.80)	20211.12 (100.00)
2004-05	190.20 (67.58)	50.20 (19.84)	41.05 (14.58)	281.45 (100.00)	15176.39 (75.03)	3091.45 (15.28)	1960.42 (9.69)	20228.26 (100.00)
2005-06	191.00 (67.85)	50.00 (17.76)	40.50 (14.39)	281.50 (100.00)	15216.10 (75.16)	3088.50 (15.25)	1940.80 (9.59)	20245.40 (100.00)
2006-07	191.80 (68.12)	49.80 (17.69)	39.95 (14.19)	281.55 (100.00)	15255.81 (75.29)	3085.55 (15.23)	1921.18 (9.48)	20262.54 (100.00)
2007-08	192.60 (68.39)	49.60 (17.62)	39.40 (13.99)	281.60 (101.00)	15295.52 (75.42)	3082.60 (15.20)	1901.56 (9.38)	20279.68 (100.00)
2008-09	193.40 (68.67)	49.40 (17.54)	38.85 (13.79)	281.65 (100.00)	15335.23 (75.55)	3079.65 (15.17)	1881.94 (9.27)	20296.82 (100.00)
2009-10	194.20 (68.94)	49.20 (17.46)	38.30 (13.60)	281.70 (100.00)	15374.94 (75.68)	3076.70 (15.15)	1862.32 (9.17)	20313.96 (100.00)

Note: Figures in bracket showing percentage to total

A comparison of projected distribution of land holdings in district Meerut with the state level average again indicated that the district is likely to have relatively higher percentage of medium and larger land holdings than the same at the state average level.



## II.9 LAND HOLDINGS: AREA

Data relating to area under each category of land holdings in the district of Meerut indicated that more than 50 per cent of the total land holdings belonged to small and marginal holdings during the year 2000-2001. The area under these groups of land holdings was recorded to be only about 47 per cent of the total holdings in the district during the year 1990-91. While looking back to an earlier picture it was found that the share of area under small and marginal holdings was only 42 per cent during the year 1985-86 in the district. Thus, the trend showed that there has been a consistent rise in the area under small and marginal holdings of the district over the last 15 years. On this basis this can be inferred that the area under this group of holdings may rise to about 59 per cent of total land holdings by the year 2009-2010.

A perusal of the same data at the state average level showed a comparatively higher share of the total area under small and marginal land holdings (Table 2.10). The share of the area under large land holdings was recorded to be 3.20 per cent in the district during the year 1985-86. However, the same has gone down to 2.80 per cent during the year 2000-2001. The projection estimate showed that this share may further go down to 2.59 per cent by the year 2009-2010. The area under large land holdings was recorded to be higher, i.e. 4.81 per cent at the state average level during the year 1985-86 which came down to 2.61 per cent during the year 2000-2001. As per projection estimates this may further go down to 1.61 per cent by the year 2009-2010.

The area under medium (medium and semi-medium) group of holdings had about 47 per cent share of the area under total land holdings of the district during the year 2000-2001. The area under these categories of land holdings was recorded to be far

higher, 51 per cent during the year 1990-91 and about 55 per cent during the year 1985-86 in the district of Meerut. The projection estimates indicated that the area under this group of land holdings may go down to about 43 per cent in the district by the year 2009-2010. The share of the medium land holdings at the state level which was about 37 per cent during the year 2000-2001 may further go down to 32 per cent during the same period.

Table 2-10 Area of Land Holdings in Meerut District and Uttar Pradesh: 1990-91 to 2009-10

(Thousand Hectares)

Year	Meerut						Uttar Pradesh					
	Marginal	Small	Semi-Medium	Medium	Large	Total	Marginal	Small	Semi-Medium	Medium	Large	Total
1985-86	59.00 (19.47)	68.20 (22.51)	92.00 (30.36)	74.10 (24.46)	9.70 (3.20)	303.00 (100.0)	4993.3 (28.29)	4114.9 (23.32)	4313.1 (24.44)	3377.4 (19.14)	849.5 (4.81)	17648.2 (100.0)
1990-91	70.80 (22.36)	75.70 (23.91)	90.6 (28.62)	69.9 (22.08)	9.60 (3.03)	316.6 (100.0)	5653.3 (31.43)	4390.7 (24.41)	4206.7 (23.39)	3042.0 (16.91)	694.0 (3.86)	17986.7 (100.0)
1995-96	76.4 (24.01)	77.5 (24.36)	93.2 (29.29)	61.8 (19.42)	9.3 (2.92)	318.2 (100.0)	6023.4 (34.02)	4214.5 (23.81)	4101.30 (23.17)	2799.7 (15.82)	562.30 (3.98)	17701.2 (100.0)
2000-01	82.45 (25.66)	79.35 (24.70)	95.85 (29.83)	54.65 (17.01)	9.00 (2.80)	321.3 (100.0)	6644.7 (37.04)	4265.05 (23.78)	4000.80 (22.30)	2560.35 (14.27)	467.30 (2.61)	17938.2 (100.0)
2001-02	83.66 (25.99)	79.72 (24.76)	96.38 (29.94)	53.22 (16.53)	8.94 (2.78)	321.92 (100.0)	6768.96 (37.64)	4275.16 (23.77)	3980.70 (22.13)	2512.48 (13.97)	448.30 (2.49)	17985.8 (100.0)
2002-03	84.87 (26.31)	80.09 (24.83)	96.91 (30.05)	51.79 (16.06)	8.88 (2.75)	322.54 (100.0)	6893.22 (38.23)	4285.27 (23.78)	3960.60 (21.96)	2464.61 (13.67)	429.30 (2.38)	18033.0 (100.0)
2003-04	86.08 (26.64)	80.46 (24.90)	97.44 (30.15)	50.36 (15.58)	8.82 (2.73)	323.16 (100.0)	7017.48 (38.81)	4295.38 (23.76)	3940.50 (21.79)	2416.74 (13.37)	410.30 (2.27)	18080.4 (100.0)
2004-05	87.29 (26.96)	80.83 (24.96)	97.97 (30.26)	48.93 (15.11)	8.76 (2.71)	323.78 (100.0)	7141.74 (39.40)	4305.49 (23.75)	3920.40 (21.63)	2368.87 (13.06)	391.30 (2.10)	18127.8 (100.0)
2005-06	88.50 (27.28)	81.20 (25.03)	98.50 (30.36)	47.50 (14.65)	8.70 (2.68)	324.40 (100.0)	7266.0 (39.98)	4315.60 (23.74)	3900.30 (21.46)	2321.00 (12.77)	372.30 (2.05)	18175.2 (100.0)
2006-07	89.71 (27.60)	81.57 (25.10)	99.03 (30.47)	46.07 (14.17)	8.64 (2.66)	325.02 (100.0)	7390.26 (40.56)	4325.71 (23.74)	3880.20 (21.29)	2273.13 (12.47)	353.30 (1.94)	18222.6 (100.0)
2007-08	90.92 (27.92)	81.94 (25.17)	99.56 (30.57)	44.64 (13.71)	8.58 (2.63)	325.64 (100.0)	7514.52 (41.13)	4335.82 (23.73)	3860.10 (21.13)	2225.26 (12.18)	334.30 (1.83)	18270.0 (100.0)
2008-09	92.13 (28.24)	82.31 (25.23)	100.09 (30.68)	43.21 (13.24)	8.52 (2.61)	326.26 (100.0)	7638.78 (46.70)	4345.93 (23.73)	3840.00 (20.96)	2177.39 (11.89)	315.30 (1.72)	18317.4 (100.0)
2009-10	93.34 (28.56)	82.68 (25.29)	100.62 (30.78)	41.78 (12.78)	8.46 (2.59)	326.88 (100.0)	7763.04 (42.27)	4356.04 (23.72)	3819.90 (20.80)	2129.12 (11.60)	296.30 (1.61)	18364.8 (100.0)

Note : Figures in bracket indicate the percentage.  
Source: Sankhyakiya Patrika.

## II.10 CONCLUSIONS

The average high population density in Meerut district is observed due to higher concentration of population in the urban part of the district. The share of workforce in total population is recorded to be marginally lower in the district as compared to the state average. A classification of total main workers among different categories in the district showed maximum concentration of main workers as cultivators, followed by agricultural labourers. The district had a far higher literacy rate as compared to the State average. In view of the increasing population, the per capita availability of land (net sown area) is likely to go down by the year 2009-2010. An analysis of trend projection relating to distribution of number of landholdings among different categories indicated that the share of land holdings falling in the medium and large group are increasing in the district. There has been a consistent rise in the area under small and marginal holdings of the district over the last 15 years.

## CHAPTER – III

### TRENDS AND PROJECTIONS OF LAND USE PATTERN

#### III.1 INTRODUCTION

The land use pattern plays an important role in the economic growth and environmental balance of any region. This part of the analysis relates to the land use pattern and trends of the district Meerut. The analysis is based upon the data procured from Board of Revenue providing information for different years about the area under nine land use categories. The related data have also been taken from the Bulletin of Agricultural Statistics published annually by the Directorate of Agriculture, U.P. The analysis broadly covers the period 1980-81 to 2000-2001. The data for the years 1980-81, 1985-86, 1990-91, 1995-96 and 2000-2001 have been taken into consideration for analyzing the changes in pattern and trends of land use.

#### III.2 TRENDS IN LAND LISE PATTERN

Table 3.1 indicates substantial difference in reporting area of the district between the years 1995-96 to 2000-2001. The reporting area of the district which was around 3.92 lakh hectares during the years 1980-81, 1985-86, 1990-91 and 1995-96 has fallen to 2.74 lakh hectares in the year 2000-2001 as per available data. The sharp decline in the geographical area was witnessed because of the transfer of some of the district's area into newly created district namely Baghpat. As a result of the transfer of more than one lakh of the district area to the newly formed district, the forest cover of the district which was around two per cent for last many years has increased to 9.71 per cent of the total geographical area during the year 2000-2001.

Table 3.1: Trends In Land Use Pattern in Meerut District

Land use category	(Hectare)				
	1980-81	1985-86	1990-91	1995-96	2000-01
Reporting area	391599 (100.00)	391714 (100.00)	391714 (100.00)	392812 (100.00)	275973 (100.00)
Forest	7992 (2.05)	7991 (2.04)	7993 (2.04)	8113 (2.07)	26787 (9.71)
Barren Land	8590 (2.19)	6128 (1.56)	4532 (1.16)	6292 (1.60)	2748 (1.00)
Land Under Non-Agricultural uses	43950 (11.22)	46692 (11.92)	47722 (12.18)	48156 (12.26)	34566 (12.52)
Culturable waste	4046 (1.03)	4439 (1.13)	6724 (1.72)	5079 (1.29)	3489 (1.26)
Permanent Pasture	610 (0.16)	353 (0.09)	402 (0.10)	373 (0.09)	377 (0.14)
Miscellaneous Trees	443 (0.11)	352 (0.09)	570 (0.15)	968 (0.25)	90 (0.03)
Current Fallow	9146 (2.34)	7592 (1.94)	6123 (1.56)	6785 (1.73)	2197 (0.80)
Other fallow	5679 (1.45)	5578 (1.43)	7470 (1.91)	6183 (1.57)	3299 (1.20)
Net area sown	311143 (79.45)	312589 (79.80)	310178 (79.18)	310863 (79.14)	202420 (73.34)

Note : Figures in bracket indicates the percentage.

Source: Statistical Bulletin.

The increased percentage of forest cover in the district after its bifurcation was witnessed mainly because most of the non-forest area was transferred to other district which reduced the total geographical area which resulted in increased proportion of the forest cover of the district.

As against forest, the other land use category of barren land has gone down over the years 1995-96 and 2000-2001. The share of the barren land in district's reported area was recorded to be 2.19 per cent during the year 1980-81. This has gone down to 1.60 per cent by the year 1995-96. It has further gone down to 1.00 per cent during the year 2000-2001. Thus, there was a general pattern of reducing area under barren land

over the years with a sharp fall in same in this district over the years 1995-96 to 2000-2001.

There was found to be a general tendency of increase in proportion of land area under non-agricultural uses throughout the state. In case of Meerut also, the percentage share of land put to non-agricultural uses has kept on increasing from around 11 per cent to nearly 13 per cent during the years 1980-81 and 2000-2001. Population growth, rural-urban migration, industrialisation and consequent urbanisation are in some important factor for increased area under non-agricultural uses.

There has been an increase in the area under culturable waste in the district Meerut over the years 1980-81 to 2000-01. Initially culturable waste constituted 1.03 per cent of the districts' reported area in the year 1980-81. This has gone upto 1.72 per cent during the year 1990-91 and further came down to 1.29 per cent and 1.26 per cent during the years 1995-96 and 2000-2001 respectively. As against this there was a reduction in the area and under current and other fallow land during this period. The area under current fallow which was 2.34 per cent during the year 1980-81 has come down to 0.80 per cent in the district during the year 2000-01. Like-wise area under other fallow land has also come down to 1.20 per cent from 1.45 per cent during the same period.

The area under pasture land which was as low as 0.16 per cent of the total geographical area has come down to 0.14 per cent in the district over the years 1980-81 and 2000-01. The percentage of pasture land was seen to be going even more than this in the district during the years 1985-86, 1990-91 and 1995-96. The area under trees and groves in the district was also found to be shrinking over the reference period. The share of area under this category was recorded to be 0.11 per cent in the year 1980-81 has



further moved to 0.09 per cent, 0.15 per cent and 0.25 per cent in successive years. This was found to be as low as 0.03 per cent during the year 2000-01.

The net sown area was found to be almost constant between 79.80 and 79.14 per cent in the district over the years 1980-81 and 1995-96. But the same was suddenly seen to be falling to 73.34 per cent during the year 2000-01. This was an outcome of withdrawal of district land for newly created district. An over view of the land use pattern of the district showed a better forest cover along with reduced cultivated area.

### **III.3 PERIOD-WISE SHIFT IN AREA UNDER DIFFERENT LAND USE CATEGORIES**

Generally no major change takes place in the geographical area of a district unless there is something take creation of a new district by taking some part of an adjoining district. In case of district Meerut, there was not any significant change in the geographical area until the year 1995-96. Only after the year 1995-96 there was more than 29 per cent fall in its geographical area due to carving out of a new district, i.e. Baghpat (Table 3.2).

The area under forest which was 2.05 per cent of the total reported area in the district during the year 1980-81, was reduced marginally over the years 1980-81 and 1985-86. It has further increased marginally during the years 1985-86 and 1990-91. An increase of about one and a half per cent in forest area was again witnessed over the years 1990-91 and 1995-96. A major increment of 18674 hectares in the forest area constituting about 230 per cent was observed in the district over the years 1995-96 and 2000-2001. The forest area of the district which was 8113 hectare upto the year 1995-96, went upto 26787 hectare by the end of the year 2000-2001. Many fold increase in

the forest area despite steep fall in the districts geographical area showed that more area under forest cover was brought through implementation of different programmes during these years.

Table 3.2 : **Periodwise shift in area under different level use Categories in district Meerut 1980-81 to 2000-01**

		(Hect)			
	Land Use Category	1985-86 Over 1980-81	1990-91 Over 1985-86	1995-96 Over 190-91	2000-02 Over 1995-96
1.	Reporting area	115 (0.03)	--	1098 (0.28)	-116839 (-29.74)
2.	Forest	-1 (-0.01)	2 (0.03)	120 (1.50)	18674 (230.17)
3.	Barren land	-2462 (-28.66)	-1596 (-26.04)	1760 (38.83)	-3544 (-56.33)
4.	Land Under non-agricultural uses	2742 (6.24)	1030 (2.21)	434 (0.91)	-13590 (-28.22)
5.	Cultivable Waste	393 (9.71)	2285 (51.48)	-1645 (-24.46)	-1590 (-31.31)
6.	Permanent pasture	-257 (-42.13)	49 (13.88)	-29 (-7.21)	4 (1.07)
7.	Miscellaneous trees	-91 (-20.54)	218 (61.93)	398 (69.82)	-878 (-90.70)
8.	Current fallow	-1554 (-16.99)	-1469 (-19.35)	662 (10.81)	-4588 (-67.62)
9.	Other fallow	-101 (-1.78)	1892 (33.92)	-1287 (-17.23)	-2884 (-46.64)
10.	Net area sown	1446 (0.46)	-2411 (-0.77)	685 (0.22)	-108443 (-34.88)

Note: Figures in bracket indicates the growth of percentage.

The area under tress and groves has gone down by about 21 per cent over the years 1980-85. Subsequently the same has grown at the rate of 62 per cent and 70 per cent over the periods 1985-90 and 1990-95. But a steep fall 878 hectare in the area under trees and groves was witnessed in the district over the years 1995-96 and 2000-2001.

The barren land in the district which was 8590 hectares during the year 1980-81 further reduced by more than 29 per cent and 26 per cent respectively over the years 1980-85 and 1985-95. But the same has increased by about 39 per cent over the years 1990-91 and 1995-96. A significant reduction of about 56 per cent in barren land of the district was achieved over the years 1995-96 and 2000-2001. Under this process the barren land which was 6292 hectares during the year 1995-96 has come down to 2748 hectares in the year 2000-2001.

There was a consistent increase in the land under non-agricultural uses in the district over the years 1980-81 to 1995-96. But a decline of more than 28 per cent was witnessed over the years 1995-96 and 2000-2001. This was found because of diversion of a significant area of the district into Baghpat during this period.

The area under cultivable waste was found to be increasing in the district over the years 1980-85 and 1985-90. But the same started reducing significantly by about 25 per cent and 32 per cent during the years 1990-95 and 1995-2000 respectively. The area under current fallow was also found to be going down significantly in the district during the year 1995-96 and 2000-2001 (Table 3.2). Other fallow land was also seem to be declining during the same period but the rate of decline was only 46.64 per cent in this as against 67.62 per cent decline in area under current fallows.

There was a net decline in area under pasture land of the district over the period 1980-81 and 2000-2001. The area under pasture land, which was 610 hectares during 1980-81 has come down to 377 hectares during 2000-2001. However, there was an increase of 1.07 per cent in the pasture land of the district over the years 1995-96 and 2000-2001.

As stated earlier, there was a net reduction in the cultivated area of the district during the years 1995-96 and 2000-2001. A reduction in the net cultivated area to the tune of 34.88 per cent was witnessed during this period.

### **III.4 GROWTH RATE OF AREA UNDER DIFFERENT LAND USE CATEGORIES**

The growth of the total reported area in the district of Meerut was negligible (0.003 per cent) during eighties. A negative growth of 2.95 per cent was further registered in the reported area during the years 1990-91 and 2000-2001. Thus, an overall negative growth of 1.48 per cent was recorded during the years 1980-81 and 2000-2001. In case of area under forest cover, there was found to be a positive growth throughout the reference period in the district. Initially the area under forest grew at 0.001 per cent during 1980-81 and 1990-91. Later on the same grew at the rate of 23.51 per cent during the years 1990-91 and 2000-2001. An overall growth of 11.76 per cent in forest area was found in the district during the reference period, i.e. 1980-81 and 2000-2001 (Table 3.3).

Table- 3.3: **Growth rate in area under different land use Categories in Meerut District**

	Land use Category	1980-81 to 1990-91	1990-91 to 2000-01	1980-81 to 2000-01
1.	Reporting area	0.003	-2.95	-1.48
2.	Forest	0.001	23.51	11.76
3.	Barren Land	-4.720	-3.94	-3.40
4.	Land Under Non-Agricultural uses	0.860	-2.76	-1.07
5.	Cultivable Waste	6.620	-4.81	-0.69
6.	Permanent Pasture	-3.410	-0.62	-1.91
7.	Miscellaneous Trees	2.870	-8.42	-3.98
8.	Current Fallow	-3.310	-6.41	-3.80
9.	Other Fallow	3.150	-5.58	-2.10
10.	Net area sown	-0.030	-3.47	-1.75

The growth of land under non-agricultural uses was found to be less than one per cent during the eighties. But the same had registered a negative growth of 2.76 per cent in successive decade, i.e. 1990-91 and 2000-2001. An overall 1.07 per cent reduction in growth was recorded in land under this category in Meerut during 1980-81 and 2000-2001.

There was found to be an overall reduction in the area under barren land in the district. The negative growth, however, was recorded to be the higher during eighties as compared to the nineties. More than 3 per cent of barren land was reduced in the district over a period of 20 years in this district.

The area under the category of cultivable waste was seen to be growing at 6.62 per cent in the district during the years 1980-81 and 1990-91 but same started going down in successive decade. The cultivable waste was reduced by 4.81 per cent during this period. Despite this, there was an overall negative growth of 0.69 per cent in the culturable waste of the district during eighties and nineties.

There was an overall reduction in the area under fallow land in the district over a period of twenty years. The current fallow reduced at a higher rate, i.e. 3.88 per cent as against other fallow land which was seen to be growing down only by 2.10 per cent during this period in the district. The reduction in current fallow was only 3.31 per cent during eighties which was reduced at much faster rate (6.41 per cent) in successive decade. In case of other fallow land, the area was found to be growing by 3.15 per cent during eighties. However, a reduction of 5.58 per cent in the same was observed during the years 1990-91 and 2000-2001. Thus, a reduction of 2.10 per cent in area under other fallow land was observed during the entire period, i.e. 1980-81 and 2000-2001.

A negative growth of area under trees and groves and permanent pasture was observed in the district. In case of trees and groves the growth was found to be positive (2.87 per cent) during 1980-81 and 1990-91. Despite this overall growth was reported to be negative (3.98 per cent) on account of more than 8 per cent reduction in this during the decade of nineties. Area under permanent pasture in the district was seen to be reducing during both the decades which resulted into an overall negative growth of 1.91 per cent during the entire period. The rate of reduction in the pasture land was recorded to be faster (3.41 per cent) during eighties as compared to only 0.62 per cent during nineties.

The growth of net area sown in the district was also found to be negative over a period of twenty years, i.e. between 1980-81 and 2000-2001. However, the net sown area did not showed significant reduction during eighties. Net sown area was reduced by 3.47 per cent during 1990-91 and 2000-2001.

### **III.5 PROJECTED AREA UNDER DIFFERENT LAND USE CATEGORIES**

In this part of the analysis an attempt has been made to project the land area under different categories taking into consideration the past trend in each category. As per projection estimates the share of area under forest is likely to grow up from present 9.71 per cent to 15.82 per cent of the total reporting area by the end of the year 2009-2010. At the same time area under miscellaneous trees and groves is likely to be reduced from 0.03 per cent in 2000-2001 to about 0.01 per cent during the year 2009-2010. This estimates is based on past trend of growth of the same in the district. As per estimates pasture land of the district which is recorded to be 0.14 per cent of the total reporting area may go upto 0.49 per cent during the year 2009-2010.



The area under barren land is likely to go down from present 1.00 per cent to 0.38 per cent during the same period. But at the same time culturable waste may go up from 1.26 per cent during the year 2000-2001 to 1.65 per cent by the end of the year 2009-2010. The land under non-agricultural uses will also be increasing as in case of other districts. The current level of land under this category (12.52 per cent) may go upto 16.20 per cent during the year 2009-2010 if the same trend continues (Table 3.4).

**Table- 3.4: Projected Area Under different land Use Classes**

Sl. No.	Land use Categories	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
1.	Reporting (Ha.)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)
2.	Forest (Ha.)	26787 (9.71)	24215 (10.59)	31451 (11.40)	33545 (12.16)	35512 (12.87)	37301 (13.52)	39009 (14.14)	40734 (14.76)	42183 (15.29)	43677 (15.82)
3.	Barren Land (Ha.)	2748 (1.00)	2459 (0.89)	2201 (0.80)	1970 (0.71)	1763 (0.64)	1578 (0.57)	1412 (0.51)	1261 (0.46)	1127 (0.41)	1008 (0.36)
4.	Land Under Non-Agricultural use (Ha.)	34566 (12.52)	35613 (12.90)	36682 (13.28)	37743 (13.68)	38804 (14.06)	39953 (14.48)	41058 (14.88)	42202 (15.29)	43452 (15.75)	44702 (16.20)
5.	Culturable waste (Ha.)	3489 (1.26)	3597 (1.30)	3708 (1.34)	3821 (1.38)	3936 (1.43)	4052 (1.47)	4174 (1.51)	4285 (1.55)	4414 (1.60)	4547 (1.65)
6.	Permanent Pasture (Ha.)	377 (0.14)	442 (0.16)	518 (0.19)	606 (0.22)	709 (0.26)	820 (0.30)	951 (0.34)	1053 (0.38)	1234 (0.45)	1354 (0.49)
7.	Miscellaneous Trees (Ha.)	90 (0.03)	85 (0.03)	80 (0.03)	74 (0.03)	68 (0.02)	63 (0.02)	54 (0.02)	49 (0.02)	42 (0.02)	36 (0.01)
8.	Current fallow (Ha.)	2197 (0.80)	1775 (0.64)	1434 (0.52)	1159 (0.42)	935 (0.34)	756 (0.27)	608 (0.22)	491 (0.18)	397 (0.14)	321 (0.12)
9.	Other fallow (Ha.)	3299 (1.20)	3160 (1.15)	3027 (1.10)	2900 (1.05)	2775 (1.00)	2656 (0.96)	2543 (0.92)	2433 (0.88)	2328 (0.84)	2225 (0.81)
10.	Net area sown (Ha.)	202420 (73.34)	199627 (72.34)	196872 (71.34)	194155 (70.35)	191470 (69.38)	188794 (68.46)	186164 (67.46)	183465 (66.48)	180796 (65.50)	178103 (64.54)

Note: Figures in brackets indicate percentage.

The area under both types of fallow land is likely to go down as per projection estimates. The current fallow land which is presently less than one per cent of the

reported area in the district may go down to 0.12 per cent only by the end of the year 2009-2010. The rate of reduction in area under other fallow land is little lower, on account of this, this may go down upto 0.81 per cent from present 1.20 per cent.

As the pressure on land for other uses than agricultures is incurring the net sown area of the district which was recorded to be 73.34 per cent of the total reported area may go down to around 65 per cent. The projected estimates are likely to provide a base for adopting measures to maintain the required area under each land use category in future.

### **III.6 CONCLUSION**

A perusal of trends of land use pattern during the years 1980-81 and 2000-2001 indicated an increased share of the forest area in the district of Meerut. This was found mainly partly because of withdrawal of non-forest area from the district and also on account of the efforts made by the forest department to increase the forest cover of the district. But the efforts to increase the area under miscellaneous trees and groves were not sufficient in the district as the area under this category was reduced and came down to almost negligible.

The area under barren land was reduced to less than half in the district during the years 1980-81 and 200-2001. Like-wise area under fallow land was also found to be reduced significantly during this period. The area under culturable waste was seen to be going up along with the land under non-agricultural uses. This calls for a realistic planning in this direction.

Area under pasture land was seen to be very low during the year 1980-81 which further has gone down marginally by the end of the year 2000-2001. The net sown area of the district was also found to be reducing over this period. As per projected estimates, this is further likely to go down if the past trend continues. The chapter provides a basis for formulate a balanced model land use plan of the district considering the present and projected states of land use under different land use categories.

## **CHAPTER IV**

### **IDENTIFICATION OF PLANNING AREAS**

A perusal of existing land use pattern indicates an abrupt utilization of land for various purposes defying the standard norm. It is so because it is generally governed by the human needs. In order to achieve a balance in this respect, formulation of land use plan with proper identification of areas for different uses is an unavoidable need. In this section an attempt has been made to scrutinize each of the nine classifications of land uses in order to identify the uses regarding model planning in Meerut district.

#### **IV.1 LAND UNDER FOREST**

Carving out the State of Uttaranchal has drastically reduced the forest cover in Uttar Pradesh. Even before formulation of the state of Uttaranchal, area under forest has been far lower than the standard norm in most of the districts falling in the plain areas of the State. In Meerut district, land area under forest has been quite lower as compared to the norm of 30 per cent share of forest area in the reported area as recommended under the National Forest Policy. In view of the progress of the State Forest Department regarding the efforts to increase the forest area in different districts of the State including the Meerut district, it was not found practical as well as possible to increase the forest area of the district to the level of 30 per cent of the reported area in the years to come. However, there is need to divert land from other uses for afforestation to increase the forest cover in the district which will require a thorough planning.

## **IV.2 BARREN LAND**

Though the area under barren land constituted only 1 per cent of the reported area in the district, but it amounted to 2748 hectares. Such a large area of barren land necessarily requires proper plan to utilize the same in the near future. According to the officials of Department of Agriculture, around 35 per cent of the total barren land in the district is rocky and hence not usable with the given level of technology of barren land reclamation. For the reclamation and use of rest of the area of barren land, Department of Agriculture and World Bank sponsored Sodic Land Reclamation Projects are in operation. In view of their past performance, it is to be decided as to how much area from the existing barren land can be treated for different uses.

## **IV.3 LAND UNDER NON-AGRICULTURAL USES**

The land used for non-agricultural purposes is found to be increasing from near 11 per cent to about 13 per cent of the total reported area in the district over the last 20 years. Increased use of the same is observed due to the process of urbanisation and industrial development. This is an important development indicator, hence may be termed as a positive sign in the present circumstances. In Meerut district around 13 per cent of the reported area is recorded under non-agricultural uses at present and is likely to increase further in the years to come. In view of this, demand of land for non-agricultural uses is to be met from other categories of land. It is observed in the past that generally agricultural land has been diverted for non-agricultural uses. In such a situation, rate of growth in the area for non-agricultural uses is to be planned. It is also to be looked into the possibility of using the non-agricultural areas for other purposes.

#### **IV.4 CULTURABLE WASTE**

The area under culturable waste constitutes around 1.26 per cent of the reported area in Meerut district. As compared to other district, its share is lower in the district. In view of the constant growth in the demand of land for different purposes, area of culturable waste can be utilized for cultivation, for increasing forest cover and for non-agricultural purposes. Therefore, land in the category culturable waste also requires proper planning for its possible use during the coming years.

#### **IV.5 PERMANENT PASTURE LAND**

The area of pasture land is around 0.14 per cent in the reported area in Meerut district. Over the last years, there has been some decline in this area. In view of the existing livestock population of the district, any further reduction in the area under pasture land would not be desirable. Therefore, in the proposed Model Land Use Plan of the Meerut district, area of pasture land would not be allowed for any other uses. It will be proposed in our plan to remain at least at the existing level in the years to come.

#### **IV.6 AREA UNDER MISCELLANEOUS TREES**

There has been a considerable decline in the area under miscellaneous trees during the past twenty years in the district. The continuous reduction in the area under miscellaneous trees has also given impetus for increasing the forest area of the district. The area under miscellaneous trees includes the area of old orchards, new orchards and scattered trees. On the whole, cutting of trees has also adverse environmental impact. In this way, from both the view points, i.e. afforestation and environment, it is proposed that any further decline in the area of miscellaneous trees would be restricted and will be maintained.



#### **IV.7 FALLOW LAND**

The area of both type of fallow land is around 2 per cent of the reported area in the district. A high share of area under other fallow land constituted around 1.20 per cent of the district's reported area during the year 2000-2001. The current fallow land also constituted around 1 per cent of the reported area. The proposed land use plan makes an attempt to devise a framework for the management of fallow land in order to divert the fallow land for cultivation and other purposes.

#### **IV.8 NET AREA SOWN**

The net sown area of the district has been substantial considering the same in the other districts and at the level of the state average. But recently, there has been a reduction in the share of the net sown area of the district due to changes in the district boundaries on account of carving out of new district. In view of this, there is need that some area of barren land, culturable waste and fallow land should be diverted to net sown area. It is therefore, needed that a plan be proposed to increase and rearrange the net sown area in the years to come in the district.

On the basis of above, following seven (7) categories of land uses in the district require planning for their proper utilization upto the year 2009-2010:

- (i) Planning for Forest Area.
- (ii) Planning for Barren Land.
- (iii) Planning for Land under Non-Agricultural Uses.
- (iv) Planning for Culturable Waste.
- (v) Planning for Current Fallow.
- (vi) Planning for Other Fallow.
- (vii) Planning for Net Area Sown.

## **CHAPTER – V**

### **LAND USE PLANNING OF MEERUT DISTRICT**

In the earlier part of the study, trends in land use pattern of the district Meerut during 1980-81 and 2000-2001 was analyzed. The analysis revealed the changes in the status of different land uses under various categories during this period. Perusal of land use trends indicated abrupt and unnatural utilization of land for various purposes. This calls for the need to prepare a proper plan for the use of land for various purposes as laid down in the nine-fold classification of land use. The proposed plan should be realistic, not utopian one which could be implemented in the future. Having considering all these points, a model land use plan for the development of different land uses has been presented here.

#### **V.1 PLAN FOR FOREST DEVELOPMENT**

The forest cover of the district Meerut was confined to around 2 per cent of the total reported area over the years 1980-81 and 1995-96. It increased to more than 9 per cent upto the year 2000-2001. Such an increase in forest cover of the district indicated an appreciable success in this respect. But this much area is still found to be much lower than the recommended norms of 30 per cent, as laid down in the National Forest Policy. Though it would be a loud thinking to increase the forest area to the level of 30 per cent during the ensuing ten years or so but concerted efforts are now needed to increase the forest area keeping in view the other financial and administrative considerations. Another important point is noteworthy here is that the future planning of increasing forest area will not amply increasing the area reserved for forest alone but greater emphasis will be

put to increase tree cover rather than forest cover. In fact, in the present circumstances, there are possibilities to increase tree cover only not the forest area. Therefore, hence onwards in this analysis, it is implied that any increase in the forest area of the district would be possible only through increasing the tree cover.

## **V.2 PLAN OF INCREASING FOREST COVER**

As the district's forest area still falls short of the recommended norms, there is need to increase the forest cover in Meerut district. Such an increase can not be planned by apportioning some areas from other land uses to develop forest area. Since the enhancement of forest is possible through increased tree cover, this may be planned by planting trees under different categories of land uses without much disturbing existing land use pattern. This may be possible through agro and social forestry.

Now the important issue is that how much land area of other land uses can be utilized for planting the trees to increase the tree cover in successive years. On the basis of discussions with the officials of the Department of Forest, Government of Uttar Pradesh, Directorate of Agriculture and Bhumi Sudhar Nigar, following methodology was adopted.

### **V.2.1 Methodology**

The cultivated area (net area sown) is found to be the most suitable for plantation of trees. But tree plantation on large scale on the cultivated area would practically not be possible. In view of this, it is to be decided that during each year, how much net sown area could be covered with the trees. Moreover, there are different categories of land owners who own land of different sizes. Under such conditions, a uniform area can not

be fixed to increase the tree cover. As shown in Table V.1, net sown area of Meerut district was classified into five different categories as it is proposed to cover different proportions of area under each class from less than one hectare to ten hectares and above. On the whole, 0.50 per cent of net sown area of the district is proposed to be covered with trees each year from 2001-2002 to 2009-2010.

Table V.1: **Proposed Plan of Tree Cover on Different Categories of Net Sown Area in District Meerut**

Land Size (Ha.)	Percentage of Area
Less than One Ha.	0.08
1 – 2 Ha.	0.42
2 – 4 Ha.	0.63
4 – 10 Ha.	0.83
10 Ha. and above	1.04
Total	0.50

The other land use category is the barren land on which plantation is proposed to be taken up in order to increase the tree cover of the district. The Directorate of Agriculture and Bhumi Sudhar Nigam are involved in the reclamation of barren land that included the Sodic land also. After meetings with the officials of both the Departments, it is revealed that in the category of barren land, about 35 per cent land is completely useless and can not be put to any other use. Thus, 35 per cent of land falling in this category is to be left and remaining 65 per cent of the land is to be considered for different uses. In our methodology, it has been decided to undertake plantation on 2 per cent of the remaining (65 per cent) barren land during the years from 2001-2002 to 2009-2010.

Land under non-agricultural uses has emerged as one of the important use of the land because of the ongoing process of urbanisation and industrialisation in Meerut district, around eleven to twelve per cent of the district's reported area has been put to different non-agricultural uses. As per estimates of department of forest, it is proposed to bring 0.50 per cent of area used for non-agricultural purposes under tree cover each year.

Culturable waste is such type of land which although not found under cultivation, but is worth bringing under cultivation. The Department of Forest plans to use 6.25 per cent of total culturable waste each year for increasing tree cover. This is found to be on the higher side as per our methodology in case of Meerut district it is planned to use 1.50 per cent of culturable waste for plantation to increase the tree cover.

The area under pasture land is lowest among all other land uses. Its area is further found to be declining continuously. In view of the existing livestock population of the state, it would not be feasible to extend tree cover on the permanent pasture land.

The area under miscellaneous trees and groves is also fast declining in the district. It is a process that has been set in and can not be stopped unless some drastic measures are adopted. But in the present circumstances, remedial measures are not likely to be affective. In view of this, the area under miscellaneous tree is likely to continue declining during the forthcoming years. Under these circumstances, whatever area of miscellaneous trees would be available, that will be treated as part of the forest area.

The fallow land is divided into two parts. One is current fallow which is left uncultivated during the current agricultural year. The other is old fallow, which remains uncultivated for more than one year. While planning for increasing the tree cover, on

such type of land, Department of Forest is optimistic to utilize much higher per cent of both types of fallow land each year as against our plan. According to our methodology, it is proposed to increase tree cover in Meerut district by bringing 0.50 per cent of the current fallow and 1 per cent of total area of other fallow land each year.

On the basis of proposed methodology, the area of different land uses of land on which tree cover has been proposed to be extended is shown in Table V.2.

Table V.2: Area of Different Land Uses on Which is to be used for Tree Cover in Meerut District

(Hect.)									
Year	Net Sown Area	Barren Land	Land under Non-Agricultural Uses	Culturable Waste	Current Fallow	Other Fallow	Existing Forest Area	Total Area Proposed for Tree Cover (2 to 8)	Percentage of Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	--	--	--	--	--	--	26787	--	9.71
2001-02	1012	36	173	52	11	33	26787	28104	10.18
2002-03	1006	34	175	49	10	31	28104	29409	10.65
2003-04	1000	33	177	46	10	29	29409	30704	11.12
2004-05	995	32	179	43	9	27	30704	31989	11.59
2005-06	989	30	182	40	9	25	31989	33264	12.05
2006-07	983	29	184	38	8	24	33264	34530	12.51
2007-08	976	28	186	35	8	22	34530	35785	12.97
2008-09	970	27	188	33	7	21	35785	37031	13.42
2009-10	963	26	191	31	7	20	37031	38269	13.87

On the basis of above estimates, there would be an addition in forest cover by 4.92 per cent in the year 2001-2002 of the existed area of the year 2000-2001. But with the passage of time, the percentage of additional tree cover to the existing forest area would nominally decline. It will come down to 3.34 per cent of the then existing forest area during the year 2009-2010. However, as per our proposed plan of forest



development, the area under forest in the district will increase. The share of forest area in total reported area of the district will increase by 10.18 per cent in the year 2001-2002 as shown in Table V.2. By the end of the year 2009-2010, the share of the forest area to total reported area will increase to 13.87 per cent. Accordingly, the share of forest area in total reported area of the district would be 11.12 per cent during the year 2003-2004. Any planning to increase forest area beyond what has been planned here would not be practically possible as substantial financial implications are involved. An estimate of the funds that would be required to increase the proposed forest cover with the assumption that the proposed increase in forest cover would be achieved through people's participation not through evolving departmental forestation. The non-departmental expenditure will cost only the supply of seedlings at the rate of 1100 seedlings per hectare, costing Rs.5.00 per seedling. The seedlings may also be grown privately and the farmers may be subsidized in the purchase of these seedlings. If it is assumed that 1100 seedlings per hectare at the rate of Rs.5.00 per seedling would be needed, the estimated financial requirement would be around 73 lakhs to 69 lakhs per year over the years 2001-2002 to 2009-2010 as becomes evident from following estimate given in Table V.3.

Table V.3 : **Finance Required for the Proposed Area in Tree Cover of Meerut District, 2001-02 to 2009-2010**

Year	Total Area (Ha.)	Total Seedling Required (No.)	Rate of Seedlings (Rs.)	Total Cost (Rs.)
2001-02	1317	1448700	5.00	7243500
2002-03	1305	1435500	5.00	7177500
2003-04	1295	1424500	5.00	7122500
2004-05	1285	1412500	5.00	7067500
2005-06	1275	1402500	5.00	7012500
2006-07	1266	1392600	5.00	6963000
2007-08	1255	1380500	5.00	6902500
2008-09	1246	1370600	5.00	6853000
2009-10	1238	1361800	5.00	6809000

### **V.3 PLAN OF BARREN LAND USE**

Data relating to land use pattern, available through government publications, area under barren land is interpreted in two forms. One is the land area under barren land which can be deemed as the part of the land which can not be utilized either for cultivation or to grow any other type of vegetation. The other form is the land area which is called the area under usar and non-cultivable land. In this categorization of barren land, the area is further bifurcated in two parts. One is the usar land which can be reclaimed and put under cultivation and other is the land which is totally worthless for any use. This is the inherent shortcoming in the published data through the Department of Agriculture, which did not clearly distinguished the area under usar land and the area which is found worthless for any use. In course of the discussion, officials of the Directorate of Agriculture agreed and highlighted towards serious drawbacks in collecting and publishing the state land use data. They also held the view that out of the given land area shown as barren, around 35 per cent is not fit for any use. Thus, on the basis of the discussions with the officials of the Agriculture Department, following barren land utilization for Meerut district has been formulated.

In the preceding analysis, 2 per cent of the reclaimable 65 per cent barren land during each year from 2001-2002 to 2009-2010 has been earmarked for afforestation to increase the tree cover in the district. Therefore, apportioned part of barren land for afforestation would be subtracted each year. The resultant area would be the area of barren land that would be available for its planning. As mentioned above, officials of the Agriculture Department held the view that 35 per cent to 40 per cent of the existing barren land is not worth for any use. Following the same observation, 35 per cent of the area from the existing barren land would be subtracted to arrive at the area of barren land which can be reclaimed for required use. Thus, 65 per cent of the barren land during each year becomes available

for reclamation. However, the entire 65 per cent area of the reclaimable barren land can not be treated at one time. In the state, Department of Agriculture and Bhumi Sudhar Nigam have been engaged in the treatment of barren land. The efforts put in by both the departments in this direction have resulted in the reduction of barren land by nearly 2 per cent per year during the last ten-fifteen years. In view of the substantial financial implication of the barren land reclamation and given the budgetary financial allotment to these departments by the government in the past, it is assumed that both the departments would be able to treat around 2 per cent of the barren land per year during the period of 2001-2002 to 2009-2010. In this way, it is assumed here that the reclaimable area of barren land in Meerut district would decline by 2 per cent per year during the period of 2001-2002 to 2009-2010. On an average 25 hectares to 35 hectares area of reclaimable barren land would be reclaimed per year in Meerut district during the years 2001-2002 to 2009-2010. In Table V.4, the plan of barren land use in case of Meerut district from the period 2001-2002 to 2009-10 has been prepared.

Table V.4 : **Proposed Plan of Barren Land Use in Meerut District**

(in Ha.)

Year	Barren Land	Rocky and Ravenous (35% of Barren Land)	Reclaimable Barren Land	Barren Land Diverted for Tree Cover	Barren Land Available for Reclamation	Proposed for Reclamation	Remaining Barren Land	Net Barren Land Available (3+8)	Percentage of Barren Land in Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	2748								1.00
2001-02	2748	962	1786	36	1750	35	1715	2677	0.97
2002-03		962	1715	34	1681	34	1647	2609	0.95
2003-04		962	1647	33	1614	32	1582	2544	0.92
2004-05		962	1582	32	1550	31	1519	2481	0.90
2005-06		962	1519	30	1489	30	1459	2421	0.88
2006-07		962	1459	29	1430	29	1401	2363	0.85
2007-08		962	1401	28	1373	27	1346	2308	0.84
2008-09		962	1346	27	1319	26	1293	2255	0.82
2009-10		962	1293	26	1267	25	1242	2204	0.80

It is evident from the above table that the 65 per cent area of barren land arrived at after apportioning 2 per cent of its area for afforestation would be around 1786 hectares in the year 2001-2002. This area under barren land will gradually decline to 1242 hectares by the end of the year 2009-2010. As proposed, 2 per cent of this reclaimable land would be treated each year. The reclaimed barren land would be 35 hectares in the year 2001-2002, 34 hectares in the year 2002-2003, 32 hectares in the year 2003-2004, 31 hectares in the year 2004-2005, 30 hectares in the year 2005-2006, 29 hectares in the year 2006-2007, 27 hectares in the year 2007-2008, 26 hectares in the year 2008-2009 and only 25 hectares during the year 2009-2010. After reclamation of this land, district of Meerut would have 1715 hectares of barren land in the year 2001-2002, 1647 hectares in the year 2002-2003, 1582 hectares in the year 2003-2004, 1519 hectares in the year 2004-2005, 1459 hectares in the year 2005-2006, 1401 hectares in the year 2006-2007, 1346 hectares in the year 2007-2008, 1293 hectares in the year 2008-2009 and 1242 hectares in the year 2009-2010 the reclaimable barren land. This left over reclaimable barren land would constitute only around 0.62 to 0.45 per cent of the total reported area of the district from the year 2001-2002 to 2009-2010. However, the barren land inclusive of non-reclaimable would constitute 0.97 per cent to 0.80 per cent of the total reported area over the same period in the district of Meerut.

#### **V.4 PLAN OF LAND AREA UNDER NON-AGRICULTURAL USES**

There has been a continuous increment in the share of area under non-agricultural uses in total reported area in the district over a period of twenty years. The same is recorded to be 11.20 per cent of the reported area of the district during the year 1980-81. It has kept on increasing to 11.92 per cent, 12.18 per cent, 12.26 per cent and 12.52

per cent during the years 1985-86, 1990-91, 1995-96 and 2000-2001 respectively. The area under non-agricultural uses showed a growth of around ten per cent during the period 1980-81 and 1995-96. With the perusal of data on land use published by Directorate of Agriculture, it appeared that the growth of area under non-agricultural uses has gone down while taking into consideration the area under non-agricultural uses during the year 2000-2001. In fact, this is not correct. The share of area under non-agricultural uses has increased during this year. There has been an overall reduction in the reported area of the district due to bifurcation of some part of the district area.

The Master Plan of Meerut, 2001, prepared by the Town and Country Planning, Department of Uttar Pradesh, land used for non-agricultural purposes in urban areas of Meerut district experienced a growth of about 40 per cent over the years 1980-81 and 2000-2001. On the basis of this, land put to non-agricultural uses in urban areas of the district had an annual growth of 2 per cent per annum during the last 20 years. It is experienced that the land used for various non-agricultural purposes in rural and urban areas of the district are the housing, commercial offices, industries, recreation/park/play ground facilities, utility and services, transport, river and open space. Taking into account the growth of population in the district and past growth in the area used for various non-agricultural purposes in urban areas of the district, it is proposed in our methodology that land area put to various non-agricultural uses would have an annual growth of 1.75 per cent each year upto the year 2009-2010. It has also been considered that which of the uses of land would be diverted to meet the 1.75 per cent growth in area of non-agricultural uses each year upto the year 2009-2010. It is decided here that current fallow, other fallow and net area sown will be the three components of land from which land would be diverted to achieve the growth of 1.75 per cent in the area used for



non-agricultural purposes. The areas of current fallow, other fallow and net sown area are proposed to be diverted to non-agricultural uses as per their proportionate share in the land use pattern of the district.

As per above mentioned plan, area put to non-agricultural uses which was 34566 hectares in 2000-2001 would increase to 38623 hectares during 2009-2010 indicating a growth of about 10 per cent during this period. Its share in the reporting area would also increase from 12.52 per cent in the year 2000-2001 to 14.00 per cent during the year 2009-2010. The year-wise increase in the area under non-agricultural uses of Meerut district from the year 2000-2001 to 2009-2010 is presented in Table V.5.

Table V.5: **Proposed Plan of Increase in the Area of Non-Agricultural Uses in Meerut District**

(Hectare)								
Year	Area Under Non-Agricultural Uses	Area of Non-Agricultural Uses Diverted for Tree Cover	Net Area Under Non-Agricultural Uses (2-3)	Net Area Sown to be Used for Non-Agricultural Uses	Area of Current Fallow to be used for Non-Agricultural Uses	Area of Other Fallow to be used for Non-Agricultural Uses	Total Area to be used for Non-Agricultural Uses (4 to 7)	% of Reporting Area
1	2	3	4	5	6	7	8	9
2000-01	34566	--	--	--	--	--	--	12.52
2001-02	34566	173	34393	6	10	586	34995	12.68
2002-03	34995	175	34820	6	10	593	35429	12.84
2003-04	35429	177	35252	7	10	600	35869	13.00
2004-05	35869	179	35690	7	10	607	36314	13.16
2005-06	36314	182	36132	7	10	615	36764	13.32
2006-07	36764	184	36580	7	10	623	37220	13.49
2007-08	37220	186	37034	7	10	631	37682	13.65
2008-09	37682	188	37494	7	10	639	38150	13.82
2009-10	38150	191	37959	7	11	646	38623	14.00



## **V.5 PLAN FOR CULTURABLE WASTE**

An area of 3489 hectares was recorded to be the culturable waste in the district of Meerut. This constituted 1.26 per cent of the reported area of the district. The past trend of the share of culturable waste in the district indicated that it was found to be increasing from 1.03 per cent to 1.72 per cent over the years 1980-81 and 1990-91. But the same started declining afterwards. It was recorded to be 1.29 per cent of reported area in the year 1995-96 which again has gone down to 1.26 per cent during the year 2000-2001. Despite declining trend in the area under culturable waste in the district, it is found reasonable to plan for using culturable waste land mainly for cultivation in view of the large population of landless and near landless people in the district. Apart from this, culturable waste land is proposed to be diverted to level of 1.50 per cent of existing land to do afforestation to increase the tree cover of the district. The officials of the Department of Agriculture, Government of Uttar Pradesh, held the view that due to one reason or the other there has been a reduction in the net sown area of the district and also in the State of Uttar Pradesh. In such a situation diversion of culturable waste may prove to be helpful in stabilizing the net area sown of the district. An overview of the decline in the culturable waste of the district indicates an overall reduction of about 1.75 per cent per annum over the years 1980-81 and 2000-2001.

In course of discussion with the officials of the Department of Agriculture to solicit their opinion regarding utilisation of culturable waste, it was found out that efforts should be made to divert 5 per cent area of culturable waste to net sown area during each year upto the year 2009-2010. This was decided on the basis of the trend of utilization of culturable waste in the past and the size of the area of culturable waste in the district. On the basis of this, the area under culturable waste would be reduced by around 45 per

cent over the years 2000-2001 and 2009-2010. This would result in a successive decline in the share of the area of culturable waste in reporting area of the district during the years 2000-2001 and 2009-2010. This would result in a successive decline in the share of the area of culturable waste in reporting area of the district during the years 2000-2001 and 2009-2010. The area under culturable waste which was 1.26 per cent of the district's reported area in the year 2000-2001, would be reduced to 0.69 per cent by the year 2009-2010. Table V.6 presents a utilization plan for culturable waste land in Meerut district.

Table V.6: **Proposed Plan for the Use of Culturable Waste in Meerut District**

(in Hectare)					
Year	Culturable Waste	Area of Culturable Waste Diverted to Tree Cover	Area of Culturable Waste Diverted to Net Area Sown	Remaining Culturable Waste (2-3-4)	% of Reporting Area
1	2	3	4	5	6
2000-01	3489	--	--	--	1.26
2001-02	3489	52	172	3265	1.18
2002-03	3265	49	161	3055	1.11
2003-04	3055	46	150	2859	1.04
2004-05	2859	43	141	2675	0.97
2005-06	2675	40	132	2503	0.91
2006-07	2503	38	123	2342	0.85
2007-08	2342	35	115	2192	0.79
2008-09	2192	33	108	2051	0.74
2009-10	2051	31	101	1919	0.69

## **V.6 PLAN FOR THE PASTURE LAND**

The district of Meerut possessed a very low area under pasture land as per data from the year 1980-81 to 2000-2001. At the initial years it was recorded to be merely 610 hectares which has further gone down to 353 hectares during the years 1985-86. This has further gone upto 402 hectares during the year 1990-91 but declined to 373 hectares and 377 hectares over the years 1995-96 and 2000-2001 respectively. Its share

in reported area has been very low, which ranged from 0.09 per cent to 0.16 per cent over the entire period. The problem of retention of pasture land in the district has been increased for and there has been encroachment on it for cultivation, despite strict Government Orders for not diverting the same to other uses including for agricultural purposes. It is also a fact that over the years the use of draft animals in cultivation has gone down drastically in the district due to tractorisation and automation of agricultural practices. This has led to reduced demand of draft animals. But still the area of the district pasture land is insufficient to cater the demand to feed the existing livestock population. This has led to cultivation of different fodder crops in the area. In view of such a situation, any further encroachment of the pasture land in the district would lead to very serious problems for feeding the livestock population in the years to come. Hence, in the proposed land use plan of Meerut district, any diversion of the area under the pasture land is to be prohibited and upto 2009-2010, there should not be any decline in the area of district pasture land, which should be ensured by the revenue officials and village panchayats.

#### **V.7 PLAN FOR THE MISCELLANEOUS TREES**

Area under miscellaneous trees includes trees groves and orchards. The land area under this category has been very low in the district. It has ranged from 0.03 per cent to 0.25 per cent of the total reported area over the last twenty years. Initially it was 0.11 per cent of the reported area which came down to 0.09 per cent over the years 1980-81 and 1985-86. Again the area under this category rose 0.15 per cent and 0.25 per cent during the years 1990-91 and 1995-96 respectively. But the same has constituted only 0.03 per cent of the districts reported area during the year 2000-2001. The area under miscellaneous trees was found reducing more than 90 per cent over the last five years.

However, this decline in the area under miscellaneous trees was recorded mainly due to diversion of district area during this period. In view of the small size of land area under miscellaneous trees and the importance of trees for healthy environmental conditions, meeting the fuel and furniture wood, there seems to be no logic that whatever area has been found available under this category should be touched for other uses. The existing government orders to check the tree cutting should be implemented strictly to see that the ongoing tree plantation planning is able to increase the tree cover of the district in the years to come.

#### **V.8 PLAN FOR CURRENT FALLOW**

Though there has been a marked reduction in the area under current fallow in the district over the last 20 years. Still more than two thousand hectares of land is found unutilized for cultivation in the category of current fallow in the district during the year 2000-2001. Earlier the area under current fallow constituted 2.34 per cent of the reported area during the year 1980-81. Subsequently, it has gone down to 1.94 per cent and 1.56 per cent during the years 1985-86 and 1990-91 respectively. It has gone up marginally to 1.73 per cent during the year 1995-96 but it has again come down to 0.80 per cent during the year 2000-01.

The area under current fallow land in the district is comparatively found to be lower than other districts of the State. But still there is a scope to see that the area which has been part of the net sown area should not be completely left unutilized.

Keeping in view the size of the area of current fallow and also the views of the officials belonging to Department of Agriculture, it has been decided in our plan to utilize 5 per cent of the area of both types of fallow land (current and old fallows) for

cultivation. The share of each of the two fallow land proposed for utilization would be divided on the basis of proportionate share of each of the fallow land in the total fallow land of the district. On this basis, the existing area under current fallow land which was 2197 hectares during the year 2000-2001 would be reduced to 1285 hectares by the end of the year 2009-2010. The share of current fallow which was 0.80 per cent during the year 2000-2001 in the reported area of the district would be slowly diverted to the cultivated area over the years and it will come down to 0.40 per cent by the year 2009-2010. Besides, it has already been planned to use 0.50 per cent of the area of the current fallow for increasing tree cover and for non-agricultural uses in their proportionate share in Meerut district during each year upto the year 2009-2010. The detailed plan of proposed utilisation of current fallow of Meerut district is presented in Table V.7.

Table V.7: **Proposed Plan for the Use of Current Fallow in Meerut District**

(in Hectare)

Year	Current Fallow	Area of Current Fallow Diverted for Tree Cover	Area of Current Fallow Diverted for Non-Agricultural Uses	Area of Current Fallow Diverted for Net Area Sown	Remaining Current Fallow Land {(2-3-4)-5}	% of Reporting Area
1	2	3	4	5	6	7
2000-01	2197	--	--	--	--	0.80
2001-02	2197	11	6	109	2071	0.75
2002-03	2071	10	6	102	1953	0.70
2003-04	1953	10	7	96	1840	0.67
2004-05	1840	9	7	90	1734	0.63
2005-06	1734	9	7	85	1633	0.59
2006-07	1633	8	7	79	1539	0.56
2007-08	1539	8	7	75	1449	0.53
2008-09	1449	7	7	70	1365	0.49
2009-10	1365	7	7	66	1285	0.40

## V.9 PLAN FOR OTHER FALLOW

The area under other fallow land signifies for the land which has not been under cultivation for more than three-four years has not been very high in the district but it is recorded to be higher than the area under current fallow land of the district. The share of the area under other fallows is recorded to be the lowest 1.20 per cent of the reported area during the year 2000-2001. Its share in reported area was found to be the 1.45 per cent during the year 1980-81. The same has gone upto 1.91 per cent during the year 1990-91 and subsequently came down to 1.57 per cent during the year 1995-96. In this way the growth of area under this category did not show any definite trend.

Since the area of the fallow land has been a part of the cultivated area, it is decided to bring some of its area under cultivation during each year upto the year 2009-2010. As mentioned earlier, 5 per cent of the area of both type of fallow land would be diverted to the cultivation during each year upto 2009-2010. The contribution of each of the fallow land in 5 per cent would be as per their proportionate share in the total fallow land of this district. In this way, as shown in Table V.8, around 1150 hectares of other fallow land would be diverted for use of cultivation by 2009-2010. Even then, the area of other fallow land would exist to the tune of 182.2 hectares in the district during the year 2009-2010. The percentage of other fallow land which is found to be 1.20 per cent during the year 2000-2001, would come down to 0.66 per cent by the year 2009-2010. Besides this, 1 per cent of the old fallow land would be diverted to increase the tree cover on annual basis in the district. Along with this a proportionate share of the decided area would also be earmarked to be used for non-agricultural uses every year.



Table V.8: **Proposed Plan for the Use of Other Fallow in Meerut District**

(in Hectare)

Year	Other Fallow	Area of Other Fallow Diverted for Tree Cover	Area of Other Fallow Diverted for Non-Agricultural Uses	Area of Other Fallow Diverted for Net Area Sown	Remaining Other Fallow Land ((2-3-4)-5}	% of Reporting Area
1	2	3	4	5	6	7
2000-01	3299	--	--	--	--	1.20
2001-02	3299	33	10	163	3093	1.12
2002-03	3093	31	10	153	2899	1.05
2003-04	2899	29	10	144	2716	0.98
2004-05	2716	27	10	135	2544	0.92
2005-06	2544	25	10	126	2383	0.86
2006-07	2383	24	10	119	2230	0.81
2007-08	2230	22	10	111	2087	0.75
2008-09	2087	21	10	105	1951	0.71
2009-10	1951	20	11	98	1822	0.66

### V.10 PLAN FOR NET AREA SOWN

The model plan for net sown area has emerged after apportioning the area under proposed plan of other uses of land upto the year 2009-2010. As stated earlier, 0.50 per cent of the net sown area is proposed to be used for increasing tree cover in the district and 97.35 per cent of the 1.75 per cent of its area is planned to be diverted for non-agricultural uses. It was also decided to reclaim 2 per cent of the barren land to be added in the net sown area. It is further planned to bring 5 per cent of the culturable waste land under cultivation each year and the same percentage area of both the fallow land, according to their proportionate share, is planned to be used for cultivation. On account of balanced use of reported area, the share of net sown area is likely to come down marginally to 59.35 per cent by the year 2009-2010 as compared to its share of

73.34 per cent during the year 2000-2001. Table V.9 presents the picture of proposed plan of net sown area for the years 2000-2001 to 2009-2010.

Table V.9 : **Proposed Plan for the Net Area Sown in Meerut District**

(in Ha.)

Year	Net Area Sown	Net Area Sown Diverted for Tree Cover	Net Area Sown Diverted for Non-Agricultural Uses	Barren Land Added to Net Area Sown	Current Fallow Added to Net Area Sown	Other Fallow Added to Net Area Sown	Culturable Waste Added to Net Area Sown	Total Net Area Sown (2-3-4+5+6+7+8)	Percentage of Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	202420	--	--	--	--	--	--	--	73.34
2001-02	202420	1012	586	35	172	109	163	201301	72.95
2002-03	201301	1006	596	34	161	102	153	200152	72.53
2003-04	200152	1000	600	32	150	96	144	198974	72.10
2004-05	198974	995	607	31	141	90	135	197769	71.66
2005-06	197769	989	615	30	132	85	126	196538	70.76
2006-07	196538	983	623	29	123	79	119	195282	70.76
2007-08	195282	976	631	27	115	75	111	194003	70.30
2008-09	194003	970	639	26	108	70	105	192703	69.83
2009-10	192703	963	646	25	101	66	98	191384	69.35

## **CHAPTER – VI**

### **MODEL LAND USE PLAN OF MEERUT DISTRICT**

In the preceeding part of the analysis, a plan has been presented to depict the land utilization for different purposes in Meerut District from 2000-2001 to 2009-2010. The plan has been prepared on the basis of three variable considerations. First is the past changes in the land use pattern in each of the nine fold classifications of land use. Second is the progress and plan of the concerned departments for the management of different uses of land and consideration of financial implications involved. Third is related with the assessment of the situation that to what extent the past trends and achievements of the concerned departments would be agglomerated to arrive at the situation which shall be closer to the reality. In this way, this is an attempt to prepare the proposed plan in a best possible manner to depict different uses of land more realistically so that its implementation becomes possible by the concerned departments.

#### **VI.1 FRAMEWORK OF THE PLAN**

The following framework was developed to prepare the Model Land Use Plan of the Meerut District:

Table VI.1: **Framework of Model Land Use Plan**

Sl.No.	Land Use Category	Constituents of Proposed Land Use Plan of each category (2000-2001 to 2009-2010)
1.	Reporting Area	Constant
2.	Forest	Existing area + 0.50 per cent area of Net Area Sown + 2 per cent area of barren land + 0.50 per cent area of Non-Agricultural Uses + 1.50 per cent area of culturable waste + 0.50 per cent area of current fallow and 1 per cent area of other fallow.
3.	Barren Land	Existing area – 35 per cent rocky and ravines – 2 per cent went to Forest – 2 per cent went to Net Area Sown.
4.	Land Under Non-Agricultural Uses	Existing area – 0.50 per cent went to Forest + 1.75 per cent area of current, other and net area sown (Share of 1.75 per cent in each category, 1.06, 1.59 and 97.35 per cent).
5.	Culturable Waste	Existing area – 1.50 per cent area went to Forest – 5 per cent area went to Net Area Sown
6.	Permanent Pasture	Constant
7.	Miscellaneous Trees	Constant
8.	Current Fallow	Existing area – 0.50 percent went to Forest – 1.06 per cent of share of 1.75 per cent went to non-agricultural uses – 40.10 per cent to be diverted to Net Area Sown as per share of 5 per cent of the Total Fallow
9.	Other Fallow	Existing area – 1.0 per cent area went to Forest – 1.59 percent share of 1.75 per cent went to non-agricultural uses – 59.90 per cent to be diverted to Net Area Sown as per share of 5 per cent of Total Fallow
10.	Net Area Sown	Existing area – 0.50 per cent went to Forest – 97.35 per cent of share of 1.75 per cent went to non-agricultural uses + 2 per cent from Barren Land + 5 per cent from Culturable Waste + 5 per cent of both fallows.

On the basis of above framework, area under forest which is to be referred as area under tree cover, which was 9.71 per cent of the reported area during the year 2000-2001 in the district, show a consistent increased and likely to attain 13.87 per cent mark as a share of the reported area by the year 2009-2010. Being a realistic plan, owing to the existing limitations in the district, this much area under tree covers would be lower than the recommended norms of 30 per cent in the district by the year 2009-2010 as envisaged in the National Forest Policy.

The plan also proposes for a consistent decline in the area of barren land from the reference year 2000-2001 to 2009-2010. Its share in the reported area of the district which was 1.00 per cent would come down to 0.80 per cent by the year 2009-2010.

As the proposed plan keeps an ample scope for expected increase in urbanization and industrialization, the proposed area under non-agricultural uses would also increase in the district from 12.52 per cent in 2000-2001 to 14.00 per cent by the year 2009-2010.

The share of area under culturable waste which was recorded to be only 1.26 per cent of the reported area during the year 2000-2001 may further go down to the level of 0.69 per cent by the year 2009-2010. This reduction in the culturable waste would bring more area under forest and cultivation during the same period in the district.

As the area under permanent pasture and miscellaneous trees were recorded to be very low, no change in these has been proposed. The concerned department are expected to do the justice to maintain the existing status of land area under these two land use categories.

Though the share of area under current and other fallow was recorded to be quite low, i.e. 0.80 per cent and 1.20 per cent of the reported area respectively during the year 2000-2001, even then about 3500 hectares of both types of fallow land was found to be existing this year. In view of this, it has been planned to reduce the area of current and other fallow at the rate of 5 per cent per annum upto the year 2009-2010. the reduced area would largely be diverted to the net sown area in respective years. Almost similar plan is proposed for current and other fallow lands of the district.

The net impact of the proposed plan for utilization of eight categories of land uses has been on the net area sown. The share of net area sown in the reported area of

Meerut district was 79.45 per cent during the year 2000-2001. On account of planned shifting of area within eight land uses, net area sown would change in successive years after 2000-2001 and its share in reported area is expected to remain around 69.35 per cent during the year 2009-2010. The following Table VI.2 presents the final proposed Model Land Use Plan of Meerut District for the period beginning from the year 2001-2002 to 2009-2010.

Table VI.2: **Model Land Use Plan of Meerut District: 2000-2001 to 2009-2010**

Land Use Category	(Hect.)									
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Reporting Area	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)	275973 (100.00)
Forest	26787 (9.71)	28104 (10.18)	29409 (10.65)	30704 (11.12)	31989 (11.59)	33264 (12.05)	34530 (12.51)	35785 (12.97)	37031 (13.42)	38269 (13.89)
Barren Land	2748 (1.00)	2677 (0.97)	2609 (0.95)	2544 (0.92)	2481 (0.90)	2421 (0.88)	2363 (0.85)	2308 (0.84)	2255 (0.82)	2204 (0.80)
Land Under Non-Agricultural Uses	34566 (12.52)	34995 (12.68)	35429 (12.84)	35869 (13.00)	36314 (13.16)	36764 (13.32)	37220 (13.49)	37682 (13.65)	38150 (13.82)	38623 (14.00)
Culturable Waste	3489 (1.26)	3265 (1.18)	3055 (1.11)	2859 (1.04)	2675 (0.97)	2503 (0.91)	2342 (0.85)	2192 (0.79)	2051 (0.74)	1919 (0.69)
Permanent Pasture	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)	377 (0.14)
Miscellaneous trees	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)	90 (0.03)
Current Fallow	2197 (0.80)	2071 (0.75)	1953 (0.70)	1840 (0.67)	1734 (0.63)	1633 (0.59)	1539 (0.56)	1449 (0.53)	1365 (0.49)	1285 (0.40)
Other Fallow	3299 (1.20)	3093 (1.12)	2899 (1.05)	2716 (0.98)	2544 (0.92)	2383 (0.86)	2230 (0.81)	2087 (0.75)	1951 (0.71)	1822 (0.66)
Net Area Sown	202420 (73.34)	201301 (72.95)	200152 (72.53)	198974 (72.10)	197769 (71.66)	195282 (70.76)	195282 (70.76)	194003 (70.30)	192703 (69.83)	191384 (69.35)



Annexure: Land Use Pattern in Meerut District

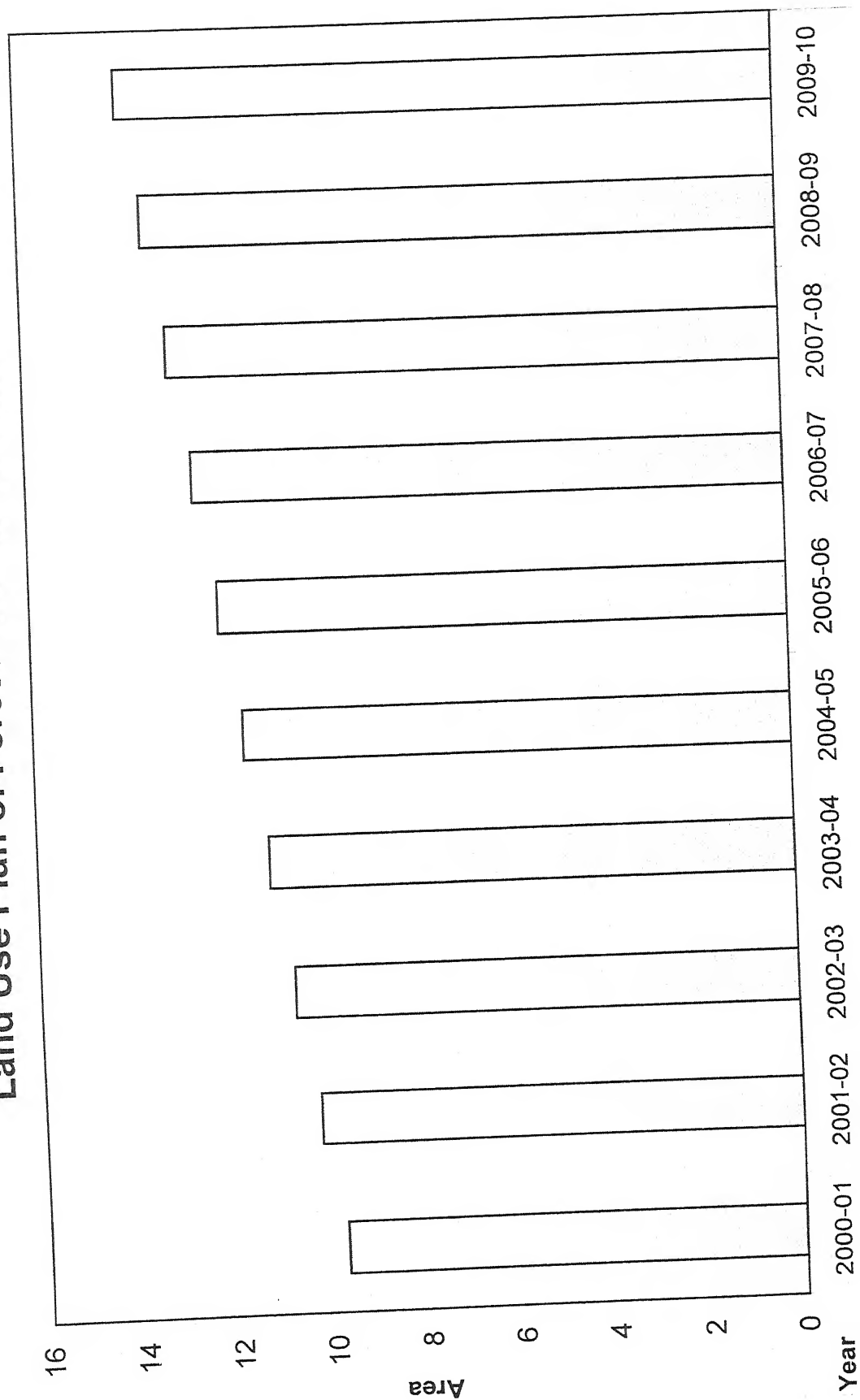
(Hect.)

Year	Land Use Categories									
	Reporting Area	Forest	Barren Land	Land Under Non-Agricultural Uses	Culturable Waste	Permanent Pasture	Miscellaneous Trees	Current Fallow	Other Fallow	Net Area Sown
1970-71	596451 (100.00)	9639 (1.61)	18489 (3.10)	58998 (9.89)	20978 (3.52)	590 (0.10)	4208 (0.71)	14375 (2.41)	7446 (1.25)	461728 (77.41)
1972-73	528708 (100.00)	9639 (1.83)	16601 (3.14)	54724 (10.35)	18342 (3.47)	591 (0.11)	3381 (0.64)	11545 (2.18)	6199 (1.17)	407686 (77.11)
1974-75	596590 (100.00)	10126 (1.69)	17683 (2.96)	63708 (10.68)	18227 (3.06)	569 (0.10)	5718 (0.96)	16752 (2.81)	7113 (1.19)	456694 (76.55)
1975-76	597696 (100.00)	10126 (1.69)	17034 (2.85)	64368 (10.77)	17483 (2.93)	632 (0.11)	5732 (0.96)	15241 (2.55)	8095 (1.35)	458985 (76.79)
1976-77	394979 (100.00)	9555 (2.42)	7885 (2.00)	41569 (10.52)	8577 (2.17)	778 (0.20)	4006 (1.01)	9541 (2.42)	4423 (1.12)	308645 (78.14)
1977-78	393296 (100.00)	7992 (2.03)	9216 (2.34)	42074 (10.70)	7120 (1.81)	850 (0.22)	2868 (0.73)	7757 (1.97)	4449 (1.13)	310970 (79.07)
1978-79	393453 (100.00)	7992 (2.03)	9103 (2.31)	42640 (10.84)	6645 (1.69)	675 (0.17)	665 (0.17)	7423 (1.89)	4493 (1.14)	313817 (79.76)
1979-80	391555 (100.00)	7992 (2.04)	8735 (2.23)	43117 (11.01)	4693 (1.20)	628 (0.16)	369 (0.09)	11649 (2.98)	4789 (1.22)	309583 (79.07)
1980-81	391599 (100.00)	7992 (2.05)	8590 (2.19)	43950 (11.22)	4046 (1.03)	610 (0.16)	443 (0.11)	9146 (2.34)	5679 (1.45)	311143 (79.45)
1981-82	391447 (100.00)	7993 (2.04)	7355 (1.88)	45585 (11.64)	4140 (1.06)	534 (0.14)	304 (0.08)	7980 (2.04)	5492 (1.40)	312064 (79.72)
1982-83	391714 (100.00)	7993 (2.04)	6750 (1.72)	45882 (11.71)	4140 (1.06)	535 (0.14)	332 (0.08)	6991 (1.79)	5491 (1.40)	313600 (80.06)
1983-84	391714 (100.00)	7993 (2.04)	6689 (1.71)	45616 (11.65)	4140 (1.06)	591 (0.15)	578 (0.15)	6979 (1.78)	5054 (1.29)	314074 (80.17)
1984-85	391714 (100.00)	7993 (2.04)	6518 (1.67)	46238 (11.80)	4203 (1.07)	385 (0.10)	317 (0.08)	7301 (1.86)	6074 (1.55)	312685 (79.83)
1985-86	391714 (100.00)	7991 (2.04)	6128 (1.56)	46692 (11.92)	4439 (1.13)	353 (0.09)	352 (0.09)	7592 (1.94)	5578 (1.43)	312589 (79.80)
1986-87	391714 (100.00)	7993 (2.04)	5663 (1.56)	47289 (12.07)	4153 (1.06)	352 (0.09)	432 (0.11)	7727 (1.97)	5803 (1.48)	312302 (79.73)
1987-88	391714 (100.00)	7992 (2.04)	4955 (1.27)	48217 (12.31)	4122 (1.05)	441 (0.11)	370 (0.10)	8259 (2.11)	7143 (1.82)	310215 (79.19)

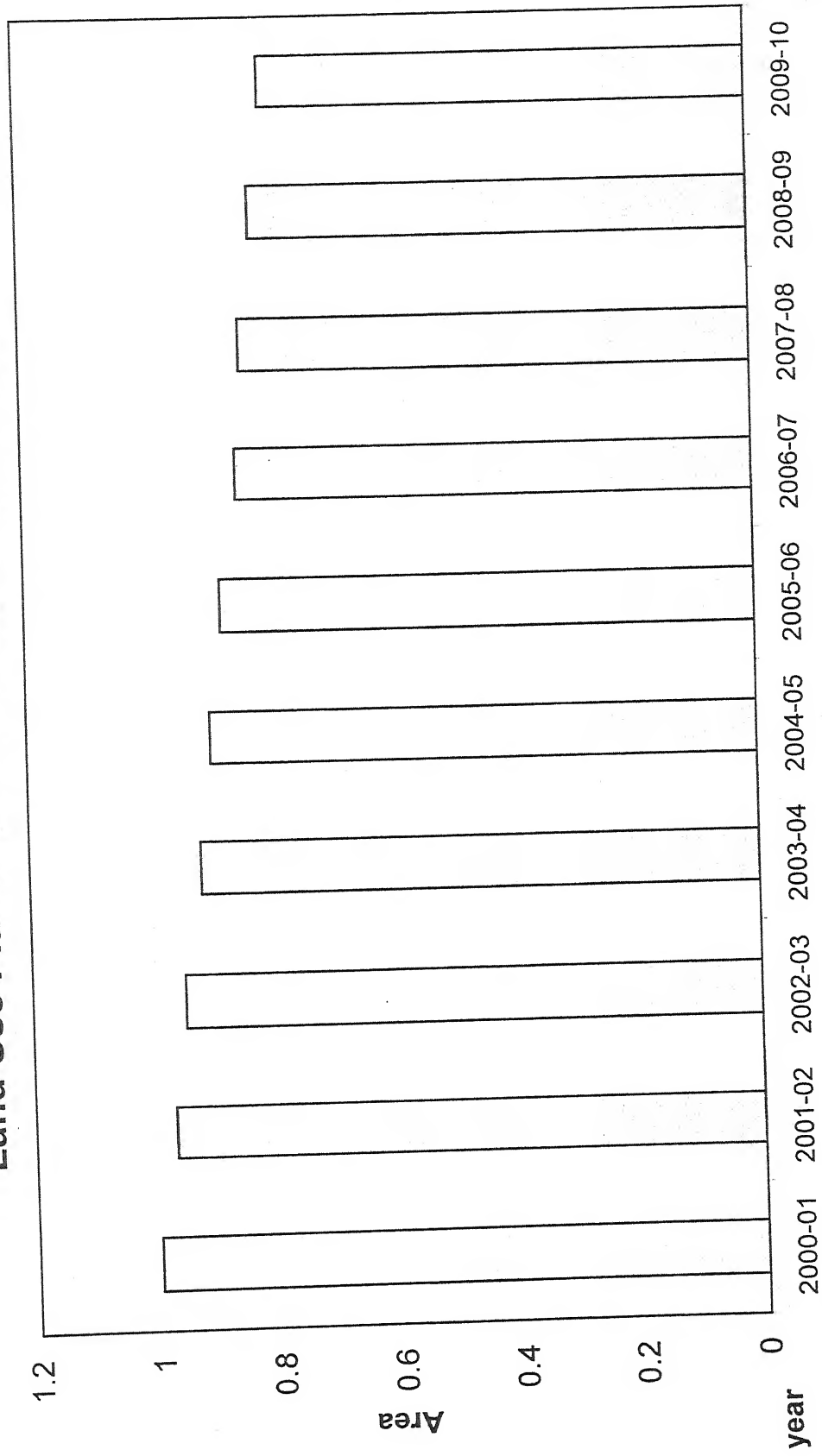
Annexure (contd.....)

Year	Land Use Categories									
	Reporting Area	Forest	Barren Land	Land Under Non-Agricultural Uses	Culturable Waste	Permanent Pasture	Miscellaneous Trees	Current Fallow	Other Fallow	Net Area Sown
1988-89	391714 (100.00)	7992 (2.04)	5659 (1.45)	48081 (12.27)	4347 (1.11)	409 (0.10)	607 (0.16)	8514 (2.17)	6627 (1.69)	309478 (79.01)
1989-90	391714 (100.00)	7992 (2.04)	5577 (1.42)	48411 (12.36)	4496 (1.14)	380 (0.10)	493 (0.13)	6413 (1.64)	7512 (1.92)	310440 (79.25)
1990-91	391714 (100.00)	7993 (2.04)	4532 (1.16)	47722 (12.18)	6724 (1.72)	402 (0.10)	570 (0.15)	6123 (1.56)	7470 (1.91)	310178 (79.18)
1991-92	391714 (100.00)	7993 (2.04)	4959 (1.27)	47317 (12.08)	6100 (1.56)	381 (0.10)	880 (0.22)	5680 (1.45)	7462 (1.90)	310942 (79.38)
1992-93	391714 (100.00)	7993 (2.04)	5423 (1.38)	46926 (11.98)	5478 (1.40)	342 (0.09)	528 (0.14)	6199 (1.58)	7093 (1.81)	311732 (79.58)
1993-94	392812 (100.00)	8113 (2.07)	6148 (1.56)	46943 (11.95)	5203 (1.32)	381 (0.10)	791 (0.20)	6550 (1.67)	6833 (1.74)	311850 (79.39)
1994-95	392812 (100.00)	8113 (2.07)	6098 (1.55)	47285 (12.04)	5025 (1.28)	380 (0.10)	740 (0.18)	7052 (1.86)	6614 (1.68)	311505 (79.30)
1995-96	392812 (100.00)	8113 (2.07)	6297 (1.60)	48156 (12.26)	5079 (1.29)	373 (0.09)	968 (0.25)	6785 (1.73)	6183 (1.57)	310863 (79.14)
1996-97	259822 (100.00)	6865 (2.64)	3434 (1.32)	32522 (12.52)	3638 (1.40)	243 (0.09)	579 (0.22)	5009 (1.93)	4000 (1.54)	203532 (78.34)
1997-98	273882 (100.00)	17826 (6.51)	3766 (1.38)	31361 (11.45)	3029 (1.11)	237 (0.09)	394 (0.14)	3846 (1.40)	3614 (1.32)	209809 (76.60)
1998-99	279669 (100.00)	22826 (8.16)	3565 (1.28)	33544 (11.99)	3214 (1.15)	242 (0.09)	141 (0.05)	3061 (1.09)	3727 (1.33)	209350 (74.86)
1999-2000	275973 (100.00)	26787 (9.71)	3224 (1.17)	33912 (12.29)	2863 (1.03)	337 (0.12)	85 (0.03)	2399 (0.87)	3219 (1.17)	203147 (73.61)
2000-01	275973 (100.00)	26787 (9.71)	2748 (1.00)	34566 (12.52)	3489 (1.26)	377 (0.14)	90 (0.03)	2197 (0.80)	3299 (1.20)	202420 (73.34)

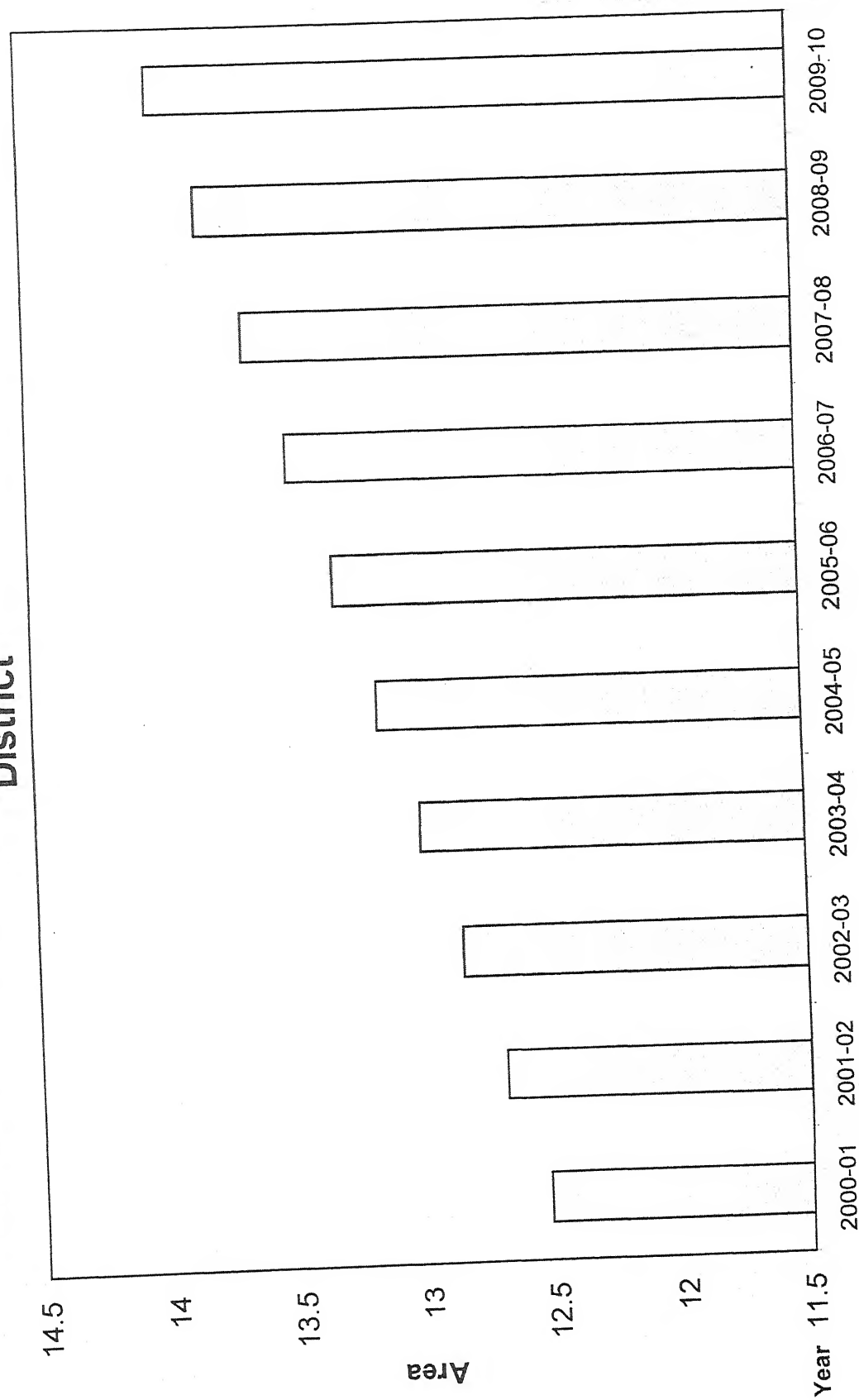
# Land Use Plan of Forest -Meerut District



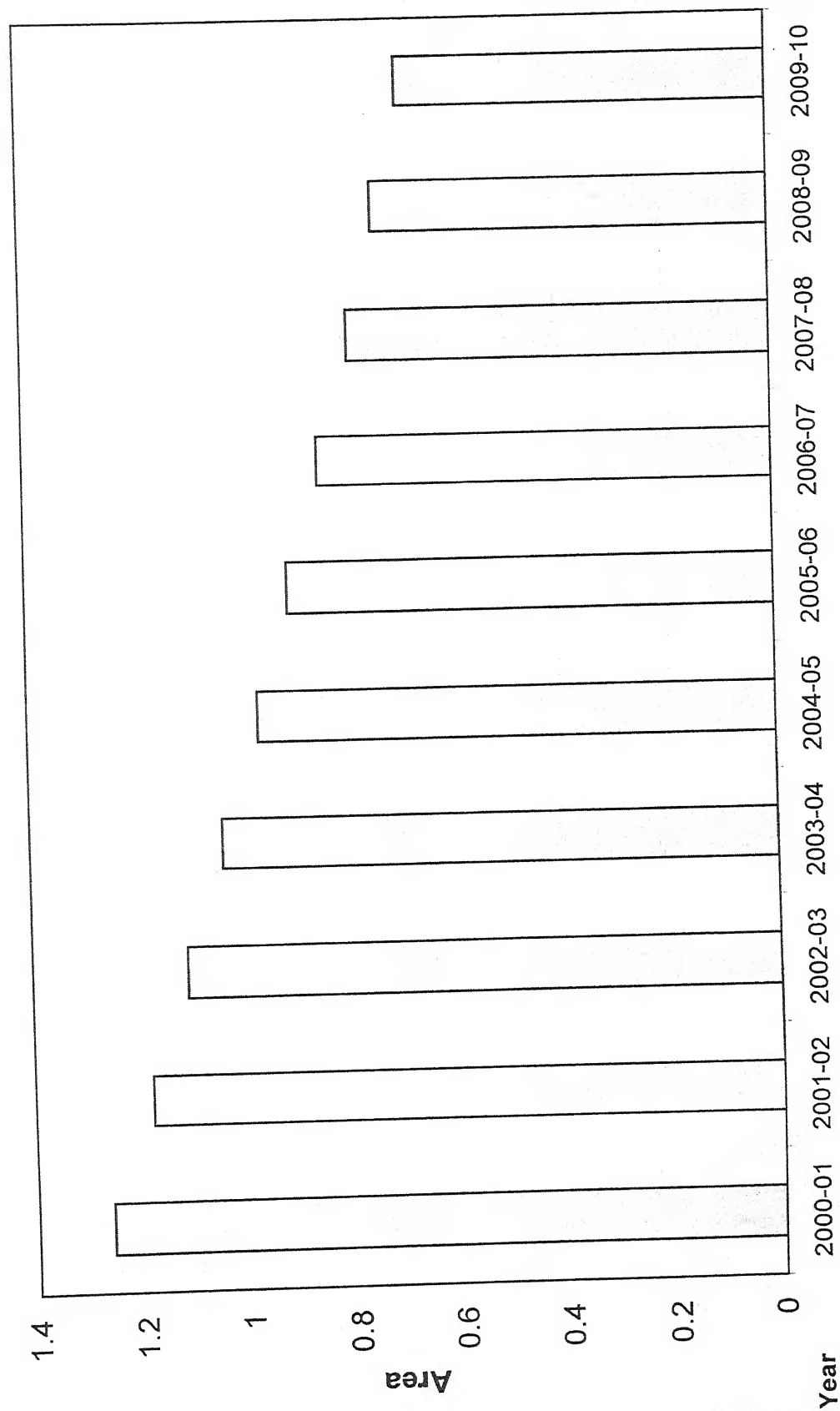
### Land Use Plan of Barren Land-Meerut District



# Land Use Plan of Land Under Non-Agricultural Uses-Meerut District

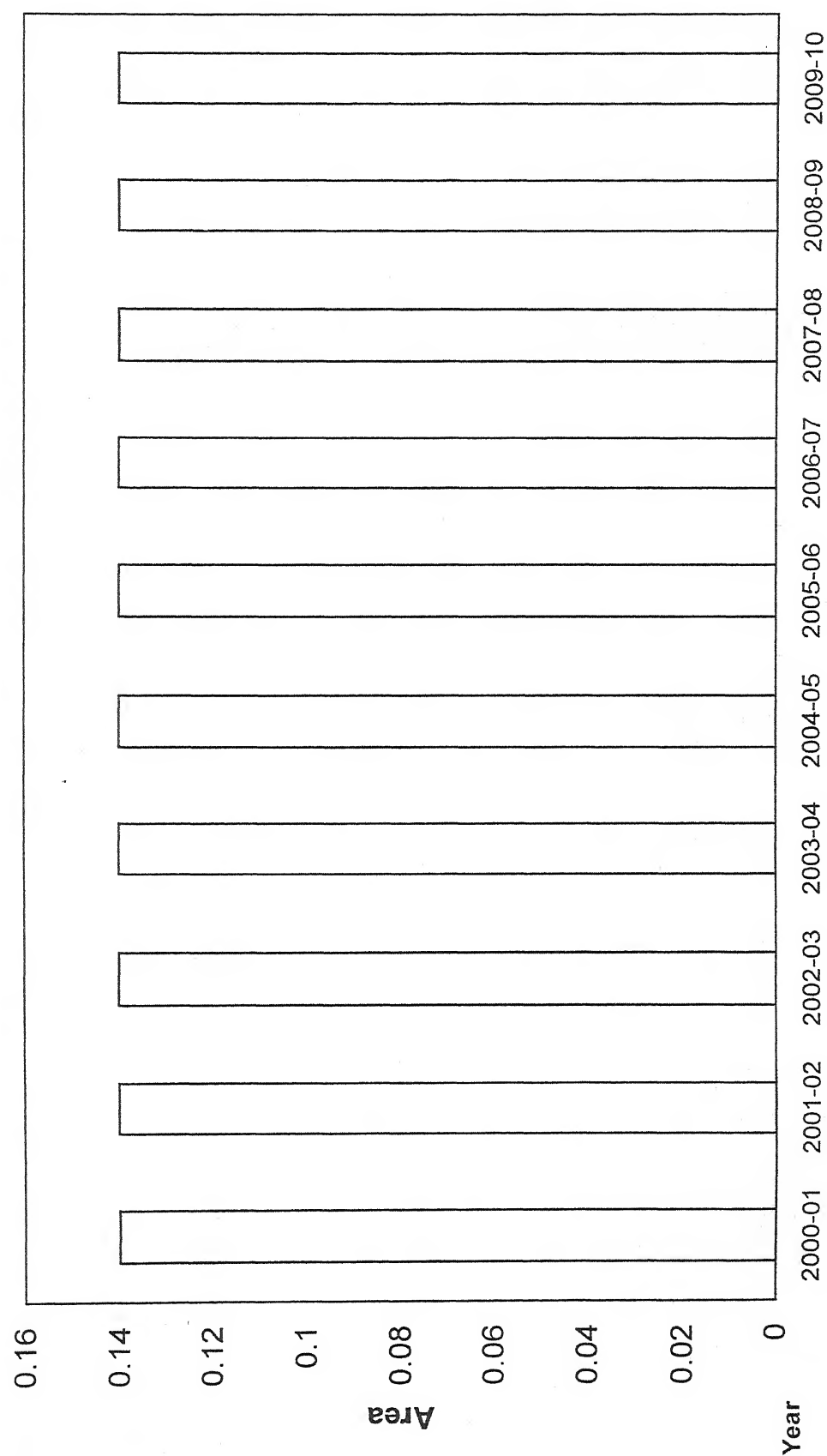


# Land Use Plan of Culturable Waste-Meerut District

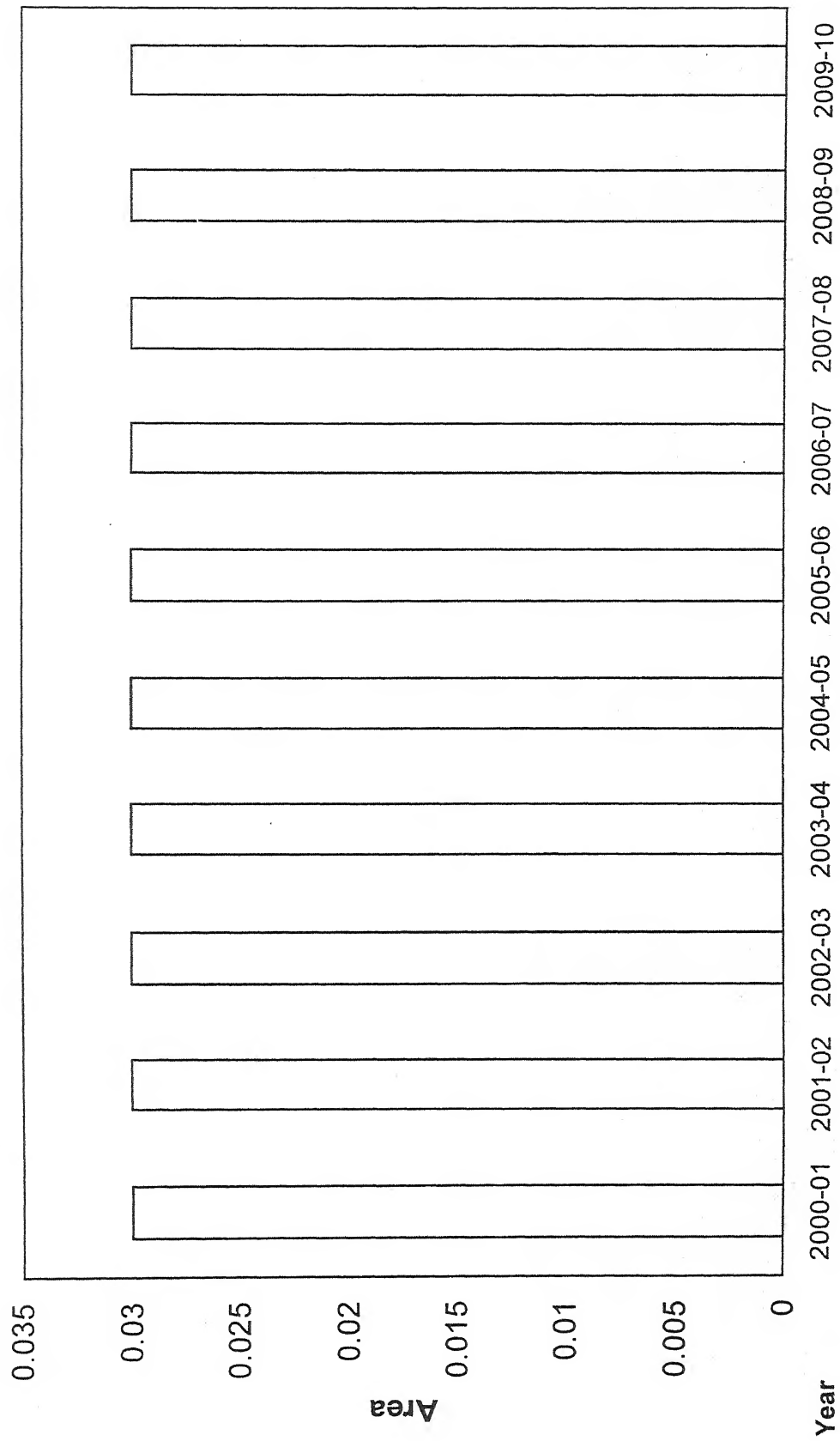




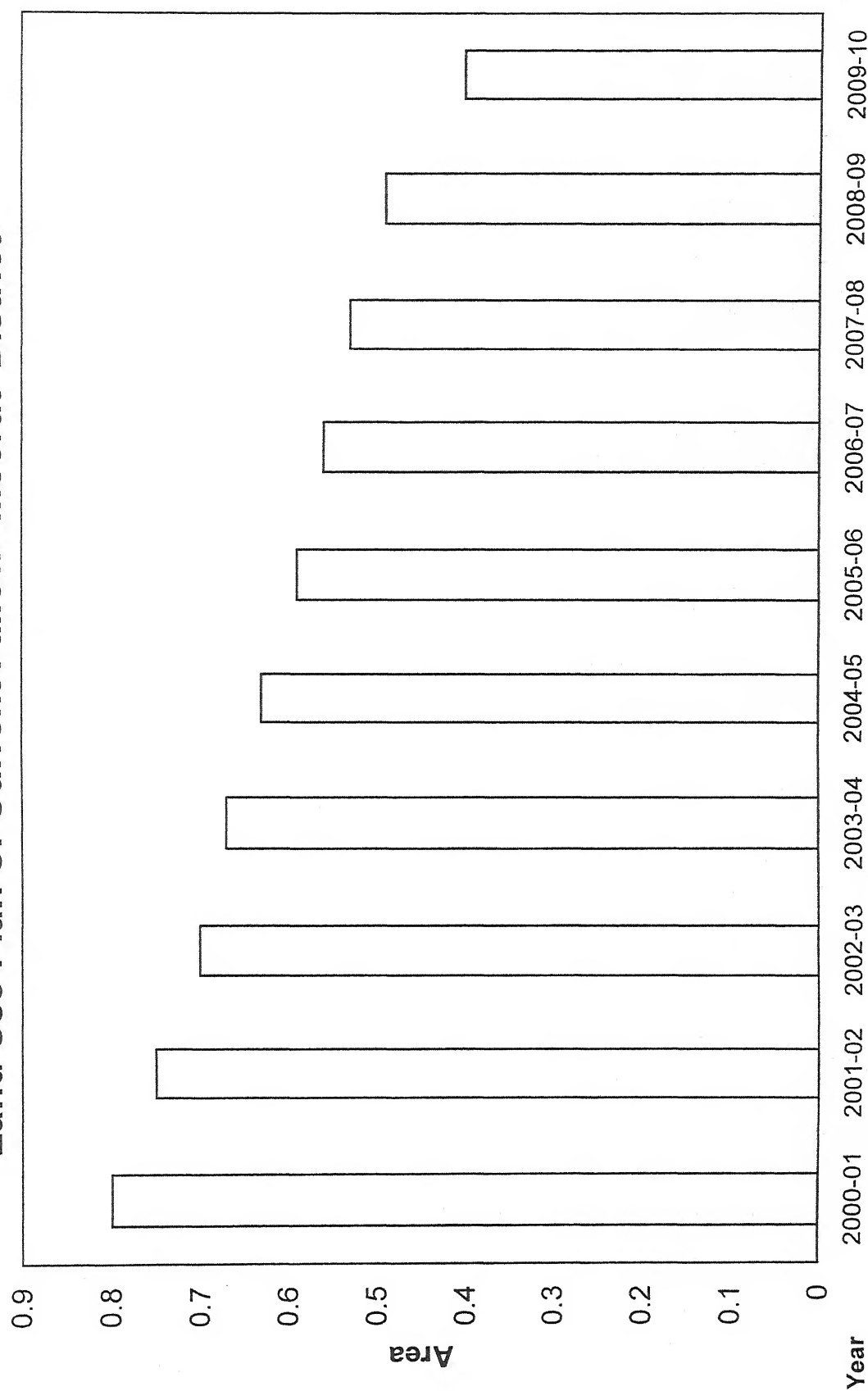
# Land Use Plan of Permanent Pasture-Meerut District



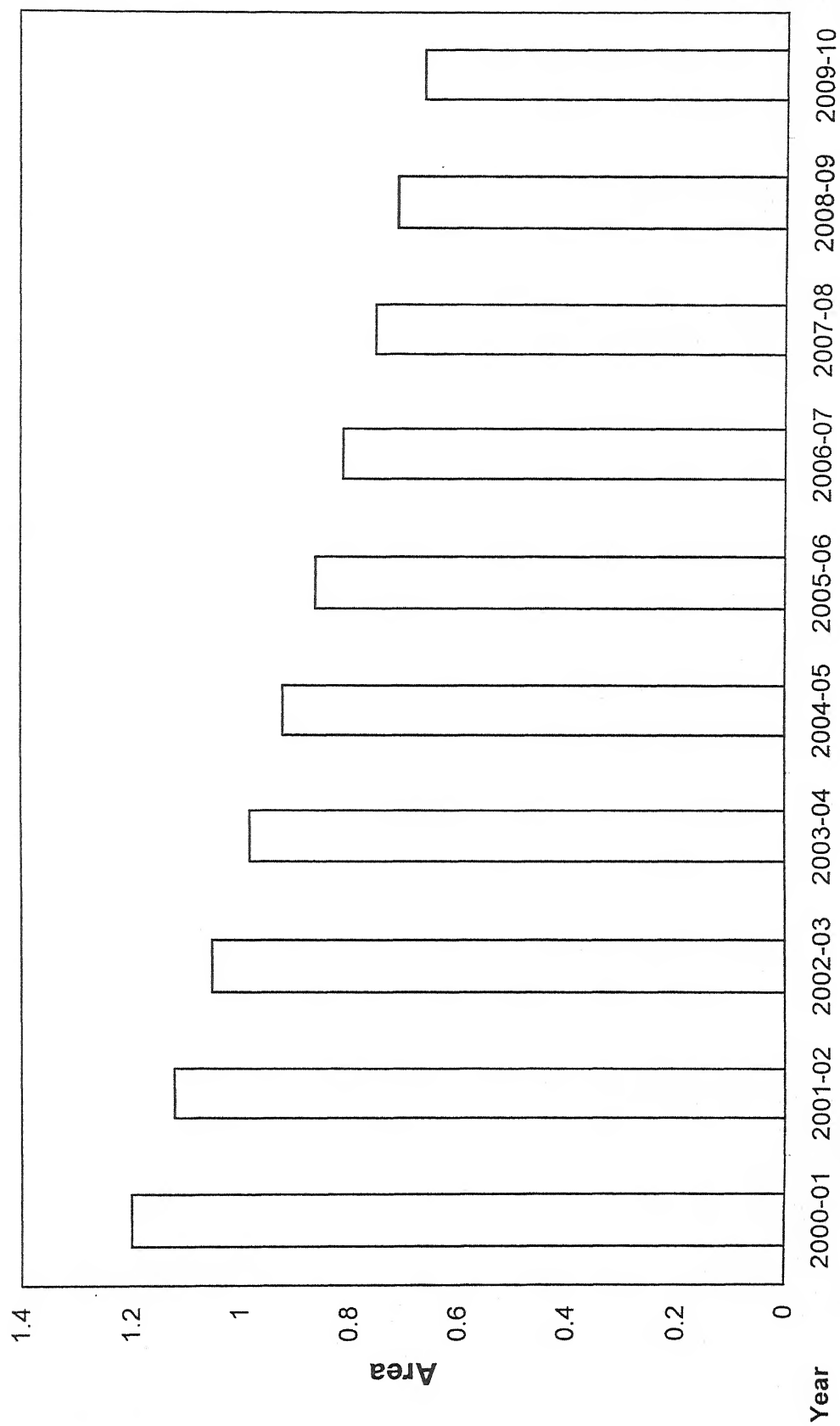
# Land Use Plan of Miscellaneous Tree-Meerut District



**Land Use Plan of Current Fallow -Meerut District**



# Land Use Plan Other Fallow- MeerutDistrict



## Land Use Plan of Net Sown-Meerut District

